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The Causes and Effects of Change Orders on the Construction Process

A Special Research Problem

Presented to

The Faculty of the School of Civil Engineering
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by

Henry J. Rowland, Jr.

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ABSTRACT

Construction today, more than ever before is an endeavor requiring the project manager to be part lawyer, engineer, architect, mediator and father confessor. The meshing of financing, material, equipment, labor, human personalities, and common sense required to build even the simplest structure in todays world is an enormous task at best. This report attempts to highlight the major complications which the modern construction manager can expect to encounter, especially as they relate to legal disputes. The report then attempts to quantify the causes and effects of construction contract change orders from a study of Southern United States construction contracts, in an attempt to provide some insight into avoiding problems on todays construction jobsite. This insight is then presented as a list of general rules to be followed or situations to be avoided while involved in the construction process.

KEY WORDS: acceleration, change order, contract, construction, delay, job.

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CHAPTER I

INTRODUCTION AND PURPOSE

The world of construction is today more complex than ever before. Buildings reaching thousands of feet into the air, tunnels boring for miles through mountains and under water, bridges spanning farther than the eye can see, an interstate highway system that could well be called the eighth wonder of the world - these are just examples of the accomplishments and challenges to the construction industry. Bearing this in mind, one can quickly appreciate amounts of labor, material, co-ordination and money which such endeavors require.

In light of the above, this paper has a threefold purpose. The first is to try and show just how complex today's construction can be and attempt to illustrate the dangers and pitfalls of modern construction operations. The second purpose is to attempt to quantify these dangers and pitfalls using change order data from a sample population of recent construction projects.

It is important to remember that change orders are, in virtually all cases, an indication that something on a construction project has not gone as planned. Inevitably a change order represents a problem on the project in terms of additional cost, or additional time or both. From the above discussion and for purposes of this paper, the premise will be: The fewer change orders a project has, the better that project has been planned and managed. For this reason, the author has chosen to fucus on the cause and effect relationship of change orders as a yardstick for measuring construction project

success.

The last purpose will be to assimilate all information in an attempt to provide, at least, some guidance as to how to approach the management of the modern construction project.

Chapter II

STATE OF THE ART

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I Introduction

At the present, litigation in construction contracting is more prevelent than ever before.[1] For this reason it is important that all parties involved in the construction process be acutely aware of their rights and responsibilities as set forth in the construction contract. In order to do this, each party must be knowledgeable of construction contract language and the meaning of this language as it is interpreted both in common usage and, most importantly, in the court rooms of today. Being knowledgeable of this language, the contractural parties must then be aware of what effects this language will have on the construction process and be prepared to minimize or avoid any adverse effects. This chapter will address the meaning of certain construction contract language as it relates to construction change orders, and attempt to provide information that will enable all parties of the contract to apply this language in a manner most advantageous to having an on time, on budget project.

For purposes of this paper the word owner will be used to mean the actual owner and/or his lawful agents (ex. construction management firm, architect and engineering firm).

Before attempting to discuss the change order process it is necessary to clearly define certain construction contract terms and situations. For this reason the discussion of change orders will be preceded by a discussion of acceleration, delay, escalation, ripple effect and impact costs.

II Acceleration

Acceleration is a process in construction which occurs when the natural or ordinary progress of events on the job site is quickened. As it refers to the construction contract, acceleration means that the contractor speeds up his work so that he is performing at a rate faster than was specified in the original contract. This effect is most commonly acheived by working overtime or double shifts.[8]

In his master's special research problem, Mr. Glen Cutler has broken acceleration into three basic categories. 1)The owner decides after contract award that he desires an earlier completion date than originally specified. 2)The contractor has encountered excusable delays for which a time extension should be granted and is granted but the owner still desires to complete the job on the originally specified date. 3)The contractor encounters excusable delay which the owner does not agree was an excusable delay and therefore, still insists on completion as originally specified. This also includes the situation where the owner will recognize part but not all of an excusable delay. Situations 1 and 2 above are not normally encountered. If they are, agreements are generally negotiated between the owner and contractor based on the usual strict contract language referring to situations 1 and 2. Situation 3 above is the one most commonly encountered and is referred to as "constructive" acceleration.[7] The courts have taken a harsh line on this issue as

indicated by McBride & Wachtel 26.70 (2); Appeal of Guaranty Construction Co., Inc., GSBCA 3109, 70-2 BCA 8483 (1970). The Board's decision as rendered was:

> The fact that Appelant incurred a substantial cost in order to expidite the performance of the job, and that this acceleration, resulting from Government's (owner's) urging, benefited Government (owner) cannot be questioned. Where a contractor is entitled by circumstances beyond his control, to an extension of his contract time, and Government (owner) denies him such extension, thereby compelling the contractor to accelerate his performance to meet the original contract deadline, contract appeals boards have held that there is a "constructive acceleration" which will entitle a contractor to compensation under the Changes clause for the additional costs incurred as a result of such acceleration.

In general there are six conditions which must be met in order to have constructive acceleration. These six conditions are supported by the above case and by Eggers & Higgins, et al. vs. U.S., 185 et. el. 765, 10 G.C. 91 482; A Teichert & Son, Inc., supra. These conditions are: 1)the contractor has encountered an excusable delay for which he is entitled to a time extension, 2)the contractor has specifically requested such a time extension from the owner and has presented that request in a timely manner as prescribed in the contract. (For an example of this requirement see Appendix B, General Provisions, Clause 3). 3)the owner has refused to grant the time extension, 4)the owner either a)expressly ordered the contractor to complete the work in the original performance

period - ie. accelerate the work or b)acted in such a way that it was clear he required the contractor to complete within the original performance period (constructive acceleration), 5)the contractor did in fact accelerate his performance, thereby incurring additional costs, and 6)the contractor has given written notice that he considers the owner's words or actions to be a change order.[7,5,14,18]

In the case of acceleration claims it is important to remember that the burden of proof is on the claimant. The claimant (contractor) must prove that he has been wronged and is due relief if he is to be compensated.[7] Some ideas on how this may be done are presented later in this chapter in the section on CPM scheduling.

III Delay

As opposed to acceleration, delay occurs when there is a slowdown of work. Delays may be caused by any party to the contract and may be a direct result of many different circumstances. Delays in the progress of a construction project almost always cause damage to both the owner and contractor, either in the form of lost revenue or in the form of extra expenses. From this it is apparent that delays often raise the issue of responsibility, an issue which is more and more frequently being decided by the courts.[1,8] From this the courts look to the cause of the delay and to the express and implied obligations and assumptions of risk in each particular contract to

determine whether either party to the contract should be made to pay monetary damages for delay. In respect to this, there are in general three types of construction delays. These are: 1)excusable delay in which the contractor is given a time extension but no money, 2)concurrent delay in which neither party recovers any damages, and 3)compensable delay in which the contractor recovers monetary damages.

Excusable Delays

When a contractor agrees to complete a project within a certain time period, or by a certain date, he assumes the risk of many reasonably forseeable types of delays. An example of this is the reasonable expectation that there will be bad weather at some point during a construction project. The contractor is not entitled to extra time for any reasonable number of days of bad weather (Ex. De Sombre v. Beckel, 118 N.W. 2d 868 (Wisc. 1963)). When a contractor is late in completing a project, he will generally be liable for the owner's damages resulting from the lateness of completion. However, the contractor can avoid this responsibility if he can show that his late completion was due to a delay for which he did not assume the risk in his contract. These types of delays are called excusable delays. Excusable delays include delays for which the owner is responsible and such other delays as excused by the contract. (See App. B, General Provisions Clause 5 for an example of

an excusable delay clause). This clause excuses delays due to the actions or inactions of the owner or his agents and events beyond the contractor's control. The clause, however, does not excuse the contractor from delays resulting from labor shortages not caused by labor disputes, from failure of the contractor's subs or vendors to perform on time, from severe, though not unusual, weather conditions and from the necessity to replace defective work or materials. The important point to note is that the contractor is responsible to the owner for delays caused not only by his actions and his subs' and suppliers' actions (Fritz v. Woldenberg, 225 N.W. 700 (Wisc. 1929)) but also for foreseeable delays caused by other parties or outside forces, except to the extent that the contract excuses such delays.

If a delay is excusable, the contractor is entitled to an extension of the contract time to reflect the delay and he cannot be held liable for damages as a result of this late completion. (Kaltoft v. Nielson, 106 N.W. 2 d 597 (Iowa 1960)). If the project is not completed on time, and if this is due to some delay that is not excusable the contractor is liable for damages. Because the exact monetary amount of this liability is usually difficult to ascertain, a liquidation damages clause is usually included in the construction contract. This clause relieves the contractor of his liability for actual delay damages and replaces it with a fixed amount for each

day the project is late as a result of a nonexcusable delay. (See App. B General Provisions Clause 5.b). It should be noted that the liquidated damages clause must attempt to reasonably approximate foreseeable actual damages. If the clause appears to be an arbitrary penalty, the owner will not be able to recover the liquidated damages and will then be forced to prove his actual damages. (Security Safety Corp. v. Kuznicki, 213 N.E. 2 d 566 (Mass. 1966)).

Concurrent Delays

In a study of concurrent delays it is first necessary to look at delays which are either excusable or not foreseeable and are thus not the contractor's responsibility. Interestingly, these delays are also not the owner's responsibility. In most standard construction contracts delays attributable to fire, labor disputes, and delays in transportation are examples of such delays. It should be obvious to a reasonable person that as a result of such delays, each party must suffer his own costs and neither party may look to the other for reimbursement. This is, in fact, the way the law is interpreted.

What probably is not as obvious to a reasonable person is that the above holds true where both the owner and contractor are legally responsible for some part of the delays experienced. An example of this is J.A. Jones Construction Co. v. Greenbriar Shopping Center, 332 F Supp. 1336 (N.D. Ga. 1971). In this case the prime

contractor caused delay through the failure of his subs and vendors to perform on time, and the owner also caused delay by constantly changing the design and by permitting his architect to be late in furnishing drawings. The court held that the law does not provide for the recovery or apportionment of damages to either party. (See also, Wright v. King, 17 s.w. 2 d 98 (Tex. Civ. App. 1929)). In cases such as these, the owner and contractor must each bear the cost of his own losses, even though one party may have been responsible for significantly more delay than the other. The court's have shown a reluctance to apportion delay damages. This reluctance most probably is based on the court's perceived lack of expertise in dealing with complex and technical problems such as causes of delay. This is particularly true where the parties fail to provide adequate proof to allow for apportionment. If, however, this proof is adequate and persuasive, some courts have apportioned delay damages where both parties are at fault. An example is Pathman Const. Co. v. Hi-Way Elec. Co., 382 N.E. 2 d 543 (Ill. 1978). In this case, the sub resisted the prime's delay damages claim on the basis that the prime was also at fault, and therefore, apportionment of the damages would be improper. The court took the position that "technological advances and the use of computers to devise work schedules and chart progress... have facilitated the court's ability to

allocate damages." From this it appears that CPM scheduling techniques may be one way of overcoming judicial reluctance to the apportionment of damages. The CPM techniques provided a reliable system for determining the impact of each of a large number of delay-causing events and thus determining the actual delay caused by each party.

As has been shown, concurrent delays are an expense borne by both parties to the construction contract. However, by prudent use of modern construction management techniques such as CPM, a contractor or owner can successfully limit his liability to only that for which he is actually responsible.

Compensable Delays

When a delay is not one which is anticipated at the time the contract is made and when a delay is due to some action or inaction which is chargeable to the owner or those under his control, the contractor may recover monetary damages for the delay. This is called compensable delay. In practice, most construction contracts are prepared either by or for the owner. As a result of this, most construction contracts contain as small a list of owner duties as possible. To circumvent this inequity, contract law has adopted a general rule, that neither party to the contract may obstruct or hinder the performance of the other. This rule has often been applied to construction contract cases in support of a contractor's

recovery of compensable delay damages. The contractor may recover costs as a result of a delay for which the owner is responsible, and in most cases, a written term of the contract does not have to be violated, but rather, there is a violation of the implied duty to cooperate by the owner in performance of the work under the contract. From this, the conclusion is that a breach of the implied duty to cooperate in performance of the work may be asserted by the contractor seeking claims recovery in a delay situation or in a situation in which he is forced to perform construction operations in an inefficient or out-of-sequence manner by virtue of some condition for which the owner is responsible.

An example of the implied duty to cooperate is found in North Shore Sewer & Water, Inc. v. Corbetta, 395 F. 2d 145 (7th Cir. 1968). In this suit, a mechanical subcontractor contracted to install a sewer. While trying to install the sewer the sub aquired additional work due to hot water leaking into his jobsite from another sewer owned by the same person with which he was contracted. In granting the subcontractor his compensable delay recovery, the court recognized the owner's implied duty to not interfere with or hinder the work of the contractor.

Failure to cooperate can take other forms. Examples are failure to provide the necessary access to the work (State v. Feigel, 204 Ind. 438, 178 N.E. 435 (1931)),

and failure to coordinate other contractors (Mason Tire & Rubber Co. v. Cummins-Blair Co., 157 N.E. 367 (Ohio 1927)).

A relatively new question in the compensable delay arena and one which must be looked at carefully, especially by the owner is: Is the owner liable for delaying the contractor if the project is still finished within the contractually allotted time? In Owen L. Schwam Const. Co., Inc., ASBCA No. 22407, 79-2 BCA 13,919 (1979) the board found the following. The contractor's schedule showed completion 70 days before the contract completion date. The contractor's schedule was reasonable. As a result of this, the contractor was entitled to compensable delays even though the project finished on or about the specified contract completion date. From this case it can be concluded that a "timely" completion (as per the contract) does not necessarily preclude recovery of delay damages, where a reasonable schedule would allow early completion. The key word in the above paragraph is reasonable. This seemingly simple word has created problems, especially for the Naval Facilities Engineering Command (NAVFAC). The following is an excerpt from an internal NAVFAC memorandum on this subject.

> ...the classic situation usually involves the Government receiving an extremely optimistic CPM Network Schedule or even one erroneously and deliberately shortened. Without knowing the resources committed to the work activities, the Government generally finds itself in a position of not being able knowledgeably refute such

> a schedule and usually ending up tacitly approving the schedule after a few rounds of weak rejection. Along comes the first change order indicating an extension of the contractor's originial erroneous schedule and the Government finds itself either paying for the extended time beyond the contractor's original completion date and within the original contract completion...or even granting a time extension and paying extended overhead to maintain the contractor...[17]

Hopefully a discussion of CPM scheduling in a later section of this chapter will provide some insight into avoiding situations such as the one above.

From the preceding discussion it should be painfully clear to all the parties of a construction contract that delays to construction must at all times be minimized and documented.

The majority of material utilized in the discussion on Delay was abstracted and/or condensed from the personal notes of Mr. John Elger, Esq. (See bibliography #8; also see bibliography #'s 3,4,16,18,19).

IV Escalation

Escalation is very similar to acceleration in that it is caused by the same course of events. These events are primarily those situations where the owner requests the contractor to speed up his performance so that the job can be completed in less than the contracted amount of time, or, in other words, to accelerate the job. As a result of this acceleration, the contractor is entitled to recovery of additional costs which he will incur such

as overtime costs and increased supervision costs. This increase in the overall value of a construction project as a result of acceleration is referred to as escalation.[3] Escalation is therefore the economic impact of acceleration.

Ripple Effect & Impact Costs

Delays or accelerations which occur, often as a result of change orders, and directly affect the completion time of a certain event or series of events on a construction project often have effects on seemingly unrelated events. This often times hidden and always troublesome phenomenon is known as the ripple effect.[3,8,15] Using this theory of ripple effect a contractor is often able to make a claim for impact costs. These impact costs are the results of having to perform the "hidden" work, referred to above, that is not a direct result of the change order. The ability of the contractor to recover impact costs is clearly supported by Clark Baridon, Inc. v. Merrit-Chapman & Scott Corp., 311 F. 2 d 389 (4th Cir. 1962).

V Change Orders

Any modification to a construction contract after contract award is called a change order. Therefore, a change order is just as legally binding as the original construction contract. In fact, a change order might even be referred to as a mini-contract.[11]

It is an accepted fact that few construction projects are built without the owner making changes or changes

being necessary due to some unforseen circumstance. As a result of this fact, the "changes" clause to the construction contract becomes most important. (See App. B paragraph 3 for an example). The changes clause becomes the vehicle through which the contractor may be entitled to additional compensation or the owner to a credit when some aspect of contract performance is rendered more or less difficult, costly, or time-consuming by the owner or his agents.[8,20]

According to contract law, parties to a contract may modify that contract at any time by mutual agreement. However, without mutual agreement neither party can modify the contract. Therefore, in order to give the owner the right to order changes to the contract, the changes clause is used. The owner's right to order changes is offset by the contractor's right to an equitable adjustment in the contract price and time, to cover the cost of the work as changed.[8,20]

The direct result of the changes clause is the change order. Through the use of the change order, the owner maintains the flexibility to adapt an otherwise rigid contract to actual on site conditions in order to achieve the goal of the project. The change order enables the owner to meet unanticipated physical conditions, correct errors in plans, and to take advantage of newly developed techniques and materials. The contractor's consent to these changes is not required; however, he is entitled to an equitable adjustment in price and time.[8,20]

Authority to Issue a Change Order

Generally speaking, the owner or his agent may authorize a change order to the contract. Whether or not the owner's architect is an agent of the owner appears to depend on the scope of the change order to be issued. In Wiggins Const. Co. v. Joint School District No. 3, 35 Wis. 2 d 632, 151 N.W. 2 d 642 (1967), a contractor was held liable to the owner for having followed the architect's order to change the roof pitch on a construction project. On the legal theory that this change was a major scope change, the court ruled that the architect could not authorize such a change.[8] The lesson to be learned here is to get all change orders in writing when in doubt as to the authority of the person issuing the change. The contractor may, as in the above case, have a moral claim against the owner, but without a written change order, this is often not a legally enforceable claim.

One legal method for overcoming the requirement for a written change order is a waiver or modification of the changes requirement in the contract. The legal theory here is that just as the owner and contractor may agree to cancel an entire contract, they may also agree to modify or waive any part of that same contract. Following this reasoning, where the spoken words of the parties, or their conduct, show an intent to require performance of extra work, and a price increase is contemplated for the contractor, and a written change order

is not required by the owner, then a court may find that both parties have waived the written change order requirement of the contract. This is supported by Ecko Enterprises, Inc. v. Remi Fortin Const. Inc., 382 A. 2 d 368 (N.H. 1978). As a practical matter all parties should be aware of the following items which will have a direct impact on the validity of a waiver claim to the contract changes clause.

"1. the owner's knowledge that the contractor considered the work to be a compensable extra;

2. the owner's insistance, nonetheless, that the work be performed;

3. any prior course of conduct, whereby "extras" were performed and paid for without written orders; and,

4. the owner's assurance or implication that a written order was unnecessary."[8]

Constructive Change Orders

A formal change order is ordinarily issued in writing by an authorized agent of the owner. Also, a formal change order is a clear admission by the owner that the change order in question is a valid change to the contract. Formal change orders rarely cause problems which are not relatively easily solved. For this reason the remainder of this discussion will focus on the most difficult of all change orders, the constructive change order. A constructive change order is different from a formal change order in that it arises from informal actions and conduct by the owner or his agents and it increases

the contractor's cost of performanc.[19]

A constructive change order occurs when agents of the owner act in a manner which has the same effect on the contractor as the issuing of a formal written change order. The important point is that the agents must have acted in such a way that they can be considered to have caused or ordered the contractor to perform work beyond the original contract scope. Since this conduct increases the time and cost of doing the job, the contractor is entitled to an equitable adjustment in contract time and price just as if a formal change order had been issued. The theory of constructive change orders is tied directly to the waiver theory previously presented. In dealing with constructive changes it is well to keep in mind the same four items presented previously as items impacting on the validity of a waiver claim.

In his book on construction law Mr. McNeil Stokes describes seven of the most common situations in which constructive changes may occur. (See bibliography #19). They are: defective specifications, change in methods of performance, misinterpretation of specifications, overinspection, rejection of conforming work, rejection of "or equal" substitutions, and defective owner-furnished property.

Since the need to recognize and eliminate constructive change orders is so great, if adverse effects on job performance are to be avoided, a brief explanation of each of the seven above situations is presented.

Defective Specifications - Generally an owner issues a set of plans and specification and a construction contract is signed based on those plans and specifications. Since the plans and specifications represent the contract, then any change to the plans and specifications is a change to that contract. This holds true in just about every situation and is supported by much case law.[8,19,20] (Ex; J.D. Hedin Constr. Co. v. United States, 347 F. 2d 235, 257 (Ct. Cl. 1965)).

Change in Methods of Performance - It is an accepted fact that where no specific construction method is specified then the contractor has a right to choose whatever method he wishes. (Ex; United Pacific Ins. Co. v. United States, 497 F .2d 1402 (et.cl. 1974)). The important point to remember in this situation is that the contractor must be ordered by the owner to use a certain method if no method was originally specified, or ordered to use a different method if a specific method was originally specified. If these changes in methods prove to be more expensive, then the contractor will be allowed to recover his time and costs.[8,19,20]

Misinterpretation of Specifications - If the owner or his representative, typically the architect, makes an error in interpreting the plans and specifications and requires more work than was originally called for, a constructive change has occurred and the contractor

is entitled to relief under the changes clause.[9,18,20] (Ex; Blanchard v. United States, 347 F .2d 268 (ct.cl. 1965)).

Overinspection - Overinspection is often a difficult contructive change to prove due to the need to rely on the "normal customs and practices" of the construction industry as a basis for this claim. However, it has been done on numerous occasions based on such things as changing the scheduling and frequency of inspections or requiring as a result of inspection a higher standard of performance.[9,18,20] (Ex.; Appeal of E. W. Sorrells, Inc., 70-2 B. C. A. ¶ 8515 (1970)).

Rejection of Conforming Work - Rejection of conforming work as a basis for a constructive change is almost always based on a difference of opinion as to how plans and specifications should be interpreted. When dealing with this type of situation it is important to be very clear on all applicable contractual provisions.

Rejection of "Or Equal" Substitutions - In many cases specifications permit "or equal" substitutions to be made to the specified construction materials. An "or equal" substitution means that equivalent or equal items may be used. If an owner rejects a contractor's substitution of materials or equipment which are less expensive but equal in performance, a constructive change has occurred. The contractor is then entitled to recover the cost difference between the less expensive product

and the product he was directed to use.[9,18,20] (Ex; The Jack Stone Co. v. United States, 344 F .2d 370 (ct.cl. 1965)).

Defective Owner-Furnished Property - Property provided by the owner must be adequate for the performance of the originally contracted work. Therefore, if the owner furnishes the contractor with defective property, material, or equipment, the additional work required of the contractor to remedy the defects is compensible and gives rise to a constructive change order.[9,18,20] (Ex; Appeal of Sutton Const. Co., 1963 B.C.A. ¶ 3762 (1963)).

By now it should be readily acceptable that change orders present problems to all involved in the construction process, especially constructive change orders. The contractor or owner who can forsee some of these problems and document their impact is not only prudent but most probably making a handsome profit. For this reason, the last area to be covered in this chapter will be the utilization of CPM techniques and the application of these techniques to a successful construction project.

The Use of CPM Techniques

The Critical Path Method or CPM as it is commonly referred to is "...the representation of a project plan by a schematic diagram or network that depicts the sequence and interrelation of all the component parts of a project, and the logical analysis and manipulation

of this network in determining the best overall program of operation."[2] This method is well suited to the control of construction projects and provides a more precise approach than bar charts and progress charts.[2] Therefore, a CPM network is nothing more than a schedule, but a very powerful schedule, as will be shown.

In preparing the CPM schedule or network on a construction project it is important to remember that, as a general rule, the party exercising the greatest amount of control over the schedule preparation is the party that will be held liable for its use.[1,10] This concept must be constantly remembered by all parties to the construction contract during the following discussion of construction claims.

Use of CPM in Construction Claims

If a CPM network is carefully and logically prepared and then periodically updated it will present a factual account of all work accomplished on a construction project. A network prepared and maintained in this manner is almost always accepted as evidence in litigation.[10]

According to Wickwire and Smith there are four major categories of construction contract claims where a properly maintained CPM schedule may be of assistance. They are: delay claims, acceleration claims, loss of productivity claims and extra work claims.[10]

In dealing with each of these different claim situations Wickwire and Smith propose the use of the

following four CPM schedules.

1. A reasonable "as-planned" CPM
2. An "as built" CPM
3. An "as-built" CPM reflecting delays - owner contractor, and excusable.
4. An "adjusted" CPM to establish completion of the project absent owner delays

They add, that it is imperative that each of these networks be accompanied and supported by project records.[23] This point cannot be over emphasized. CPM schedules do not constitute proof in and of themselves. The results established by these schedules must be supported by proofs of factual causation. In order for a CPM schedule to be used successfully in litigation it must 1)be reasonable, 2)be substantiated by basic contract records and 3)be kept current by periodic updating and if not kept current, at least be capable of reconstruction from contract records.[10]

Summation

When dealing with the causes and effects of change orders it is necessary to deal with virtually every facet of construction. The planning, scheduling, controlling, financing, construction method, time of construction, construction claims, and ultimate construction cost all, in some way or another, eventually become a function of the project change orders. Hopefully, this chapter has, at the very least, made the reader more aware of the care which must be exercised if a construction project

is to be on time and on budget.

In further chapters the author will attempt to categorize and show some of the cause and effect relationships mentioned above which occur on construction projects as a result of change orders.

Chapter III

RESEARCH AND DATA COLLECTION

In order to find a suitable population from which to extract sample data, the author requested the aid of the Southern Division of the Naval Facilities Engineering Command located in Charleston, S.C. The primary mission of Southern Division is the accomplishment of the construction of public works, public utilities and special facilities for the United States Navy and other Federal Agencies. This is accomplished through the use of construction contracts. For the administration of these contracts, Southern Division has numerous field offices dispersed throughout the Southern United States. See Figure I for the locations of these offices. The Southern Division through these field offices awards in excess of one thousand construction contracts annually.

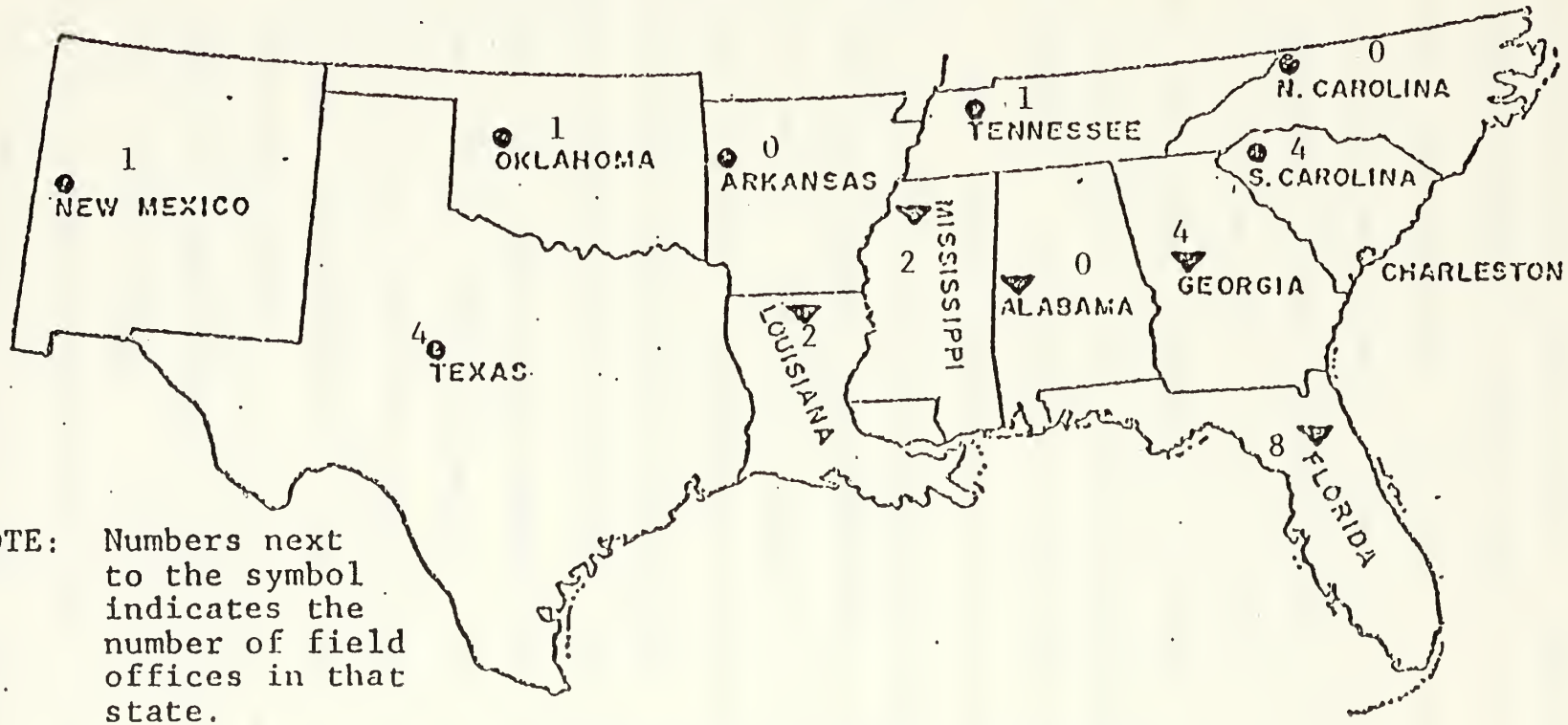
Because the author was familiar with both the organization and the personnel at Southern Division, and because the annual contract volume at Southern Division was so large, the author experienced little trouble with his on site data collection.

The large geographical area and many diversified construction contracts handled by Southern Division presented an excellent sample population, one which the author feels to have been highly representative of the entire U.S. construction industry.

It was decided to use the most recently completed projects since the data obtained would be timely and any non-recorded details could be more readily supplied by the office personnel from menory. Since the primary

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND



NOTE: Numbers next to the symbol indicates the number of field offices in that state.

▽ Eastern Area

● Western Area

SOUTHERN DIVISION'S GEOGRAPHICAL AREA OF RESPONSIBILITY

Figure I

area of interest was the effects and causes of change orders, the sample projects were selected based on the total number of contract change orders. Those jobs with the largest numbers of change orders in the time period surveyed were selected. In order to ensure that the data collected on each project was uniform, the author developed a data collection sheet similar to one used by Mr. Glen Cutler in his analysis of acceleration and contract claims.[7] See Figure II for an example of this form. This form proved to be slightly less than adequate. The form had no space for recording the spread of the various contractor bids on each project. Only the bid actually winning the job was recorded. This was thought to be adequate at the time; however, as the author progressed further in his research he found a need to return to Southern Division's files and record all bids submitted on each project.

The form is broken down as follows. The contract number, the date the contract was awarded, and the length of the contract are all self explanatory. The contract price was the value for which the contract was awarded and the government estimate was the fair cost or owner's estimate. The change orders to date and price were the total number of change orders on each contract and the total cost of these changes. Sections 8, 9, and 10 all delt with the type of schedule utilized (ie. CPM, Bar Chart, etc.) and how effectively that schedule was maintained and utilized. Sections 11 through 21

FACT SHEET

1. CONTRACT NUMBER: _____

2. DATE AWARDED: _____

3. CONTRACT LENGTH: _____ CALENDAR DAYS

4. CONTRACT PRICE: $_____

5. GOVERNMENT ESTIMATE: $_____

6. CHANGE ORDERS TO DATE AND PRICE: _____ 7. _____

8. TYPE OF SCHEDULE UTILIZED: _____

9. WAS SCHEDULE KEPT CURRENT: _____

10. IF ANSWER TO #10 ABOVE NO, GIVE REASON: _____

_____

_____

CLAIM(S)

11. TYPE: _____

_____

12. DOLLAR VALUE OF INITIAL CLAIM: $_____ $_____

13. PRESENT VALUE OF CLAIM: $_____ $_____

14. ITEMS CLAIMED (DIRECT OR INDIRECT): _____

_____

_____

15. GOVERNMENT ESTIMATE: $_____ $_____

16. TIME EXTENSION REQUEST/GRANTED: _____, _____

17. SETTLED AMOUNT: $_____ $_____

18. LEVEL SETTLED (IF NOT, PRESENT STATUS): _____

19. REASON SETTLED: _____

_____

_____

_____

20. FACTUAL BACKGROUND OF CLAIM: _____

_____

_____

_____

21. WHAT ACTION TAKEN TO AVOID CLAIM: _____

_____

_____

all delt with contract claims. While this information was gathered initially, it was later found to be beyond the scope of this paper to utilize this claim information. This information is, however, presented in Appendix B without comment as a basis for continued research.

In addition to the information already discussed, the author found it most helpful to also record a brief description of each project and a brief explanation as to the major causes of change orders on these projects. This information later proved to be invaluable when the author began compiling the data.

Each contract file contains tremendous amounts of information. Reviewing and condensing specific portions of each file is an extremely tedious and time consuming process. Because of this and also because of a limited amount of time available to site in Charleston, the author was able to review only twenty seperate contract files. However, the results of the data compilation indicates that this sample size is adequate as is seen in the next Chapter.

Lastly the author would like to thank Mr. Jules Dursse, Mrs. Sarah Briley and Mr. Andrew Demos of Southern Division for their kind assistance in the review of Southern Division contract files. Their assistance was vital to the successful completion of the author's research.

Chapter IV

Graphical Analysis of Research

In attempting to analyze the large amounts of data available in Appendix B, the primary goal at all times was to display the data as a function of the number of change orders. Overall job cost, differences between bids on the project, the type of construction and the complexity of construction were all graphically represented as a function of the number of change orders. This common basis from which to compare the different aspects of the construction process led to a clearer understanding of the raw data and the trends within that data.

Appendix C contains the graphical presentation of the results of this paper on basically two different types of charts. The first type shows the breakdown of the overall sample population into classifications. This involves only one chart, C-1, which is utilized mainly to show the distribution of the sample population by job size. The second type of chart is the most important. Charts C-2 through C-8 are charts of this type. In general each of these charts attempts to show a statistical correlation between the number of change orders per job on the ordinate as opposed to some other construction project variable on the abscissa.

The first step in preparing each of these graphs was to group the data to be compared on the x axis. The data was grouped based on the following general requirements: 1)Attempt to group data such that each group will have an equal number of observations.

2)Make group range large enough so that differences between groups will be statistically observable. Depending on how well the data cooperated, these rules were followed as closely as possible.

The next step was to plot the number of change orders occuring in each group. On the graphs, each point represents the number of changes which occurred on a specific job. Having plotted the number of change orders on each job by group, the next step was to statistically average the number of change orders by group. The mean, standard deviation, number of jobs in each category (number of observations) and the range of the observations were calculated for each group. The averages from the different groups were then compared to the averages of the other groups in an effort to detect any trends in the data.

The sample consisted of twenty construction projects chosen from the Southern Division files in a manner already described. Of the twenty projects sampled one project was categorically rejected by the author after analyzing the data. In referring to Appendix B, job number nine was the job rejected. The reason this job was rejected was because it had a total of fifty-six change orders. This one project had 3.4 times more change orders than the combined average of the total change orders on all other projects. The author decided, upon evaluation, that inclusion of job nine, with its fifty-six change orders, would cause a false interpretation

of the data.

The data also contained one project which was not a competitively bid project, as were the rest. Since the only major difference between this negotiated project and the other nineteen projects in the sample was the manner in which the contract was awarded, it was decided to leave this project, job number nineteen, in the sample. The basic conclusion by the author was that in this case, job nineteen was no different from the other projects in the construction methods utilized on this job and those which were under consideration in this paper. Since job nineteen had no competitive bids, the reader should note that the sample populations of figures C-3, C-5, and C-6 in Appendix C were taken from a sample of only eighteen jobs. This is because each of these graphs was prepared utilizing the bid data from each job in the sample.

Figure C-1

Figure C-1 was prepared in order to show that the sample population utilized here-in covered the entire range of major construction in terms of job size or job cost. The classification numbers represent specific cost ranges into which each sample project was classified. The ranges are as follows:

CLASSIFICATION	AWARD PRICE
I	$100,000 - $1,000,000
II	$1,000,000 - $2,500,000
III	$2,500,000 - $5,000,000
IV	over $5,000,000

An important point to note is that each classification had a similar sample size (ie. number of contracts), therefore providing a representative sample of the entire range of job costs. Another important result was that the mean value in each classification, in general, closely correspond to the median point of each classification's range.

From the above results, it can be concluded that the twenty sample population utilized represents the majority of construction from large to small. This should mean that results obtained from this data will contain all of the effects which occur as a result of differing project size. Differing economies of scale, communication, coordination, control problems and many other real life construction concerns should occur within this data. The next graph presented supports this conclusion.

Figure C-2

As was indicated, Figure C-2 is an extension of C-1. It further supports the expected result which is the larger a project gets, the greater the margin for error. Managerial spans of control often become

over extended. Coordinating different design phases becomes much more complex. Communication channels become longer and longer and information feed back becomes distorted. These are just a few of the problems which can occur as construction projects become larger and more complex and are reasons for change orders which occur on larger construction projects. The data presented in Figure C-2 supports the hypothesis that the larger the project the greater the margin for error. It is readily seen from observing the mean number of change orders in each group of Figure C-2 that the larger the project the greater the number of change orders that occur. Whether or not these change orders are for the reasons presented is questionable. The author proposes that, at the very least, these reasons have an impact on project performance.

Figure C-3

Figure C-3 is an attempt to show that the larger the difference between the owner's fair cost estimate and the low bid on a project, the greater the likelihood that a job will experience more change orders. The difference considered here is an absolute value. It considers only the magnitude of the difference and not whether the low bid is above or below the fair cost estimate. The data again supports the expected hypothesis that the greater the difference between the fair cost estimate and the low bid the more change orders a job will experience. The

average number of change orders per job increases significantly from group one through group three on Figure C-3. The groups are divided as shown utilizing the percent difference values developed in column (11) a)of Appendix P. Note that group four shows an average number of change orders of 13.8 for projects having greater than a 15% difference. This is not consistent with the trend established by groups one through three. The author does not, however, feel that this invalidates the assumption that the hypothesis is correct, due to the strong trend established in the first three groups. It is a curious result and one for which the author can offer no explanation.

Figure C-4

Figure C-4 divides the jobs into two groups, those low bids above the fair cost or owner's estimate and those low bids below the fair cost estimate. The hypothesis is that more change orders will occur on jobs where the low bid is less than the fair cost estimate. This is a reasonable assumption considering the possibility that a bid lower than the fair cost estimate may not have included some aspect of the job or may have little contingency reserve figured in. In this case the data did not support the hypothesis. The average number of change orders per job was higher by an average of 3.2 change orders on those jobs which the low bid was higher than the fair cost estimate - exactly

the opposite of the hypotheses! The author does not accept this conclusion, but rather presents the following explanation. Due to the fact that the numerical results in Figure C-4 cannot be considered statistically rigororous, perhaps the 3.2 difference in average number of change orders is not significant. That being the case, the conclusion is that whether the low bid is above or below the fair cost estimate has no effect on the number of change orders a job will experience.

Figure C-5

Figure C-5 represents the percent difference between the low bid and the next low bid (See Appendix B, Column (12) b)) as a function the number of change orders per job. The hypothesis is that the greater the difference between the low bid and the next low bid the greater the number of change orders. This is a logical assumption, assuming that in a competitive economy, there is an error in any low bid that is significantly lower than the next low bid whether that error is intentional or not. This being the case, the low bidder will attempt to recoup the losses due to his erroneous bid, by attempting to increase the number of change orders. As can be seen from Figure C-5 the number of change orders occurring in group one was almost double the number in group two. This is a contradiction of the hypothesis. However, upon further consideration this result points to a very logical conclusion, a conclusion

that illustrates the effects of the economy on the construction process. The author proposes that as a result of a lean economy where few jobs are available, the number of contractors bidding on each job increases, therefore; the competition increases dramatically. As a result of this competition, the dollar range between bids becomes compressed. Contractors begin cutting more and more out of their estimates in an effort to obtain a job. Once again, the low bidder, who finally does get the job is forced to attempt to recover his losses using change orders. This is further supported by comparing groups two and three. The drastic decrease in change orders for these two groups tends to support the idea that as the economy becomes fatter and more jobs become available, the range between bids tends to become greater and contractors begin including the costs which were excluded when the job market was tighter. Inclusion of contingencies, markups, and less corner cutting in general lead to fewer change orders.

Figure C-6

The author was so intrigued by the results obtained from Figure C-5 that Figure C-6 was developed to further test the hypothesis of the fat versus lean economy presented above. Figure C-6 represents the percent difference between the low bid and the highest bid (See Appendix B, Column (17) b)) as a function of the number of change orders per job. A comparison of groups one and two once again shows that the number of change orders occurring

in group one is significantly higher than group two. A comparison of groups two, three and four, also once again, shows that the number of change orders begin decreasing as the difference between the low bid and the high bid begins to increase.

From Figures C-5 and C-6 the conclusion which must be inferred is that many bids, all close in value on a particular job indicates a lean market and that a lean market indicates that a project is going to tend to have a higher number of change orders.

Figure C-7

Figure C-7 was an attempt to show that as job complexity increases, so do the number of change orders. Each job was assigned a complexity rating as described in Appendix B, (See Appendix B, Column (8)) and was then plotted as a function of the number of change orders per job. Figure C-6 shows that the average number of change orders in groups one and two were statistically the same, but that group three had significantly more change orders than either groups one or two. This tends to support the conclusion that as the complexity increases, so does the number of change orders. However, the lack of any real difference between groups one and two and the marked difference between group three tends to indicate that the complexity of a particular job must be major and markedly distinguishable before an increase in the number of change orders can be expected.

Figure C-8

Figure C-8 plotted the various types of construction as defined in Appendix B (See Appendix B, Column (13)) against the number of change orders per job. Commerical construction had the lowest average number of change orders. This is the expected results since commercial construction is generally unspecialized and consists mostly of light construction requiring little equipment coordination.

The group, or in this case groups, experiencing the next highest incidence of change orders were industrial construction and specialized construction. The reason for the higher number of changes on the special construction is most probably due to the uniqueness of each construction job. Contractors cannot or will not specialize in these areas and, therefore; they develop little expertise on these types of jobs. Industrial work usually involves the coordination of delivery and installation of large pieces of very specialized equipment. This is probably the single largest reason for the increased number of change orders on industrial type jobs.

Heavy construction experiences the greatest number of change orders per job. The most logical and perhaps the only logical reason, for this is due to unforseen conditions. On further contemplation, the fact that the greatest number of change orders occur because of unforeseen condition is quite reasonable. Unforeseen

conditions are the most difficult to anticipate and therefore; are generally not properly documented in the project plan or contract. Often any situation occurring other than the most common or expected situation will justify a change order.

From the above, it is possible to rank the different types of construction projects relative to the number of change orders to be expected on each type.

Chapter V

Summation and Research Continuation

As a result of the data presented in chapter four, the author presents the following list of general "rule of thumb" items which the wary and successful construction project manager should always remember.

1. The larger the dollar value of a construction project the more change orders it will have.
2. The larger the difference between the low bid and the fair cost estimate the more change orders a job will have.
3. A job whose bids are all very close in dollar value is a job that is going to experience a large percentage of change orders.
4. An extremely complex or unusual job is going to experience more change orders than less complex or more common types of construction.
5. All types of construction projects experience change orders, however; some types experience more than others. In ascending order from least to most number of change orders to be expected, the following list of job types is presented.
   a. Commerical construction
   b. Industrial and Special construction
   c. Heavy construction

As was stated, these are rules of thumb and the user should be familiar with how these conclusions were reached. More importantly, these rules apply with certainty only to the author's twenty sample population, and no

guarantees are made. However, the author believes that mixing these rules with liberal doses of experience and common sense will allow the project manager to apply these rules to virtually any construction situation.

The possibilities for future research in this area are enourmous. To begin with, the data presented in Appendix B presents numerous opportunities for further study in many areas of construction besides change order impact. There is much data still to be analyzed in this appendix.

One area which was only begun in this report is a study of the impact which the state of the economy has on the entire construction process. Some examples could be: The effect of the economy on construction labor quality. The effects of the economy on construction work methods. The effects of the economy on bidding strategies. What effect will each of these have on the construction process in terms of delays, change orders and contractural disputes?

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APPENDICIES

APPENDIX A

March 1981

GENERAL PROVISIONS
(Construction Contract)

(Provisions 1 through 29 are those prescribed by the General Services Administration in Standard Form 23-A (Rev. 4-75), as amended pursuant to the latest revisions of the Defense Acquisition Regulation.)

March 1981

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GENERAL PROVISIONS
(Construction Contract)

(Provisions 1 through 29 are those prescribed by the General Services Administration in Standard Form 23-A (Rev. 4-75), as amended pursuant to the latest revisions of the Defense Acquisition Regulation.)

1. DEFINITIONS (1964 JUN)

(a) The term "head of the agency" or "Secretary" as used herein means the Secretary, the Under Secretary, any Assistant Secretary, or any other head or assistant head of the executive or military department or other Federal agency; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the head of the agency or the Secretary.

(b) The term "Contracting Officer" as used herein means the person executing this contract on behalf of the Government and includes a duly appointed successor or authorized representative. (DAR 7-602.1)

2. SPECIFICATIONS AND DRAWINGS (1964 JUN)

The Contractor shall keep on the work a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy either in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at his own risk and expense. The Contracting Officer shall furnish from time to time such detail drawings and other information as he may consider necessary, unless otherwise provided. (DAR 7-602.2)

3. CHANGES (1968 FEB)

(a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make any change in the work within the general scope of the contract, including but not limited to changes:

(i) In the specifications (including drawings and designs);

(ii) In the method or manner of performance of the work;

(iii) In the Government-furnished facilities, equipment, materials, services, or site; or

(iv) Directing acceleration in the performance of the work.

(b) Any other written order or an oral order (which terms as used in this paragraph (b) shall include direction, instruction, interpretation, or determination) from the Contracting Officer, which causes any such change, shall be treated as a change order under this clause, provided that the Contractor gives the Contracting Officer written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a change order.

(c) Except as herein provided, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment hereunder.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any order, an equitable adjustment shall be made and the contract modified in writing accordingly. Provided, however, that except for claims based on defective specifications, no claim for any change under (b) above shall be allowed for any costs incurred more than 20 days before the Contractor gives written notice as therein required: And provided further. that in the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with such defective specifications.

(e) If the Contractor intends to assert a claim for an equitable adjustment under this clause, he must, within 30 days after receipt of a written change order under (a) above or the furnishing of a written notice under (b) above. submit to the Contracting Officer a written statement setting forth the general nature and monetary extent of such claim, unless this period is extended by the Government. The statement of claim hereunder may be included in the notice under (b) above.

(f) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract. (DAR 7-602.3)

4. DIFFERING SITE CONDITIONS (1968 FEB)

(a) The Contractor shall promptly, and before such conditions are disturbed, notify the Contracting Officer in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in this contract. The Contracting Officer shall promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of

any part of the work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.

(b) No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in (a) above, provided, however, the time prescribed therefor may be extended by the Government.

(c) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract. (DAR 7-602.4)

5. TERMINATION FOR DEFAULT - DAMAGES FOR DELAY - TIME EXTENSIONS (1969 AUG)

(a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within such time, the Government may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event the Government may take over the work and prosecute the same to completion, by contract or otherwise, and may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. Whether or not the Contractor's right to proceed with the work is terminated, he and his sureties shall be liable for any damage to the Government resulting from his refusal or failure to complete the work within the specified time.

(b) If fixed and agreed liquidated damages are provided in the contract and if the Government so terminates the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

(c) If fixed and agreed liquidated damages are provided in the contract, and if the Government does not so terminate the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until the work is completed or accepted.

(d) The Contractor's right to proceed shall not be so terminated nor the Contractor charged with resulting damage if:

(1) The delay in the completion of the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, acts of the public enemy, acts of the Government in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the Government, fires, floods, epidemics, quarantine restrictions. Strikes, freight embargoes, unusually severe weather, or delays of subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and such subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any such delay (unless the Contracting Officer grants a further period of time before the date of final payment under the contract), notifies the Contracting Officer in writing of the causes of delay.

The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the work when, in his judgment, the findings of fact justify such an extension, and his findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in the "Disputes" clause of this contract.

(e) If, after notice of termination of the Contractor's right to proceed under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the contract contains a clause providing for termination for convenience of the Government, be the same as if the notice of termination had been issued pursuant to such clause. If, in the foregoing circumstances, this contract does not contain a clause providing for termination for convenience of the Government, the contract shall be equitably adjusted to compensate for such termination and the contract modified accordingly; failure to agree to any such adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes."

(f) The rights and remedies of the Government provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

(g) As used in paragraph (d)(1) of this clause, the term "subcontractors or suppliers" means subcontractors or suppliers at any tier. (DAR 7-602.5)

6. DISPUTES (1980 JUN)

(a) This contract is subject to the Contract Disputes Act of 1978 (P.L. 95-563).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved in accordance with this clause.

(c) (1) As used herein, "claim" means a written demand or assertion by one of the parties seeking, as a matter of right, the payment of money, adjustment, or interpretation of contract terms, or other relief, arising under or relating to this contract. However, a written demand by the Contractor seeking the payment of money in excess of $50,000 is not a claim until certified in accordance with (d) below.

(2) A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim for the purposes of the Act. However, where such submission is subsequently disputed either as to liability or amount or not acted upon in a reasonable time, it may be converted to a claim pursuant to the Act by complying with the submission and certification requirements of this clause.

(3) A claim by the Contractor shall be made in writing and submitted to the Contracting Officer for decision. A claim by the Government against the Contractor shall be subject to a decision by the Contracting Officer.

(d) For contractor claims of more than $50,000, the Contractor shall submit with the claim a certification that the claim is made in good faith; the supporting data are accurate and complete to the best of the Contractor's knowledge and belief; and the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable. The certification shall be executed by the Contractor if an individual. When the Contractor is not an individual, the certification shall be executed by a senior company official in charge at the Contractor's plant or location involved, or by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

(e) For contractor claims of $50,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For contractor-certified claims in excess of $50,000, the Contracting Officer must decide the claim within 60 days or notify the Contractor of the date when the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) Interest on the amount found due on a contractor claim shall be paid from the date the Contracting Officer receives the claim, or from the date payment otherwise would be due, if such date is later, until the date of payment.

(h) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer. (DAR 7-103.12)

7. PAYMENTS TO CONTRACTOR (1979 MAR)

(a) The Government will pay the contract price as hereinafter provided.

(b) The Government will make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates approved by the Contracting Officer. If requested by the Contracting Officer, the Contractor shall furnish a breakdown of the total contract price showing the amount included therein for each principal category of the work, in such detail as requested, to provide a basis for determining progress payments. In the preparation of estimates the Contracting Officer, at his discretion, may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site may also be taken into consideration (1) if such consideration is specifically authorized by the contract, and (2) if the Contractor furnishes satisfactory evidence that he has acquired title to such material and that it will be utilized on the work covered by this contract.

(c) In making such progress payments, there shall be retained 10 percent (10%) of the estimated amount until final completion and acceptance of the contract work. However, if the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, he may authorize such payment to be made in full without retention of a percentage. Also, whenever the work is substantially complete, the Contracting Officer shall retain an amount he considers adequate for the protection of the Government and, at his discretion, may release to the Contractor all or a portion of any excess amount. Furthermore, on completion and acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made therefor without retention of a percentage.

(d) All material and work covered by progress payments made shall thereupon become the sole property of the Government, but this provision shall not be construed as relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work, or as waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(e) The Contractor shall, upon request, be reimbursed for the entire amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after furnishing evidence of full payment to the surety.

(f) Upon completion and acceptance of all work, the amount due the Contractor under this contract shall be paid upon the presentation of a properly executed voucher and after the Contractor shall have furnished the Government with a release of all claims against the Government arising by virtue of this contract, other than claims in stated amounts as may be specifically excepted by the Contractor from the operation of the release. If the Contractor's claim to amounts payable under the contract has been assigned under the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), a release may also be required of the assignee. (DAR 7-602.7)

8. ASSIGNMENT OF CLAIMS (1976 OCT)

(a) Pursuant to the provisions of the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), if this contract provides for payments aggregating $1,000 or more, claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Unless otherwise provided in this contract, payments to an assignee of any moneys due or to become due under this contract shall not, to the extent provided in said Act, as amended, be subject to reduction or setoff. (The preceding sentence applies only if this contract is made in time of war or national emergency as defined in said Act; and is with the Department of

Defense, the General Services Administration, the Energy Research and Development Administration, the National Aeronautics and Space Administration, the Federal Aviation Administration, or any other department or agency of the United States designated by the President pursuant to Clause 4 of the proviso of Section 1 of the Assignment of Claims Act of 1940, as amended by the Act of May 15, 1951, 65 Stat. 41.) (DAR 7-602.8)

(b) In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret," "Secret," or "Confidential," be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same. However, a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer. (DAR 7-602.8)

9. MATERIAL AND WORKMANSHIP (1964 JUN)

(a) Unless otherwise specifically provided in this contract, all equipment, material, and articles incorporated in the work covered by this contract are to be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in this contract, reference to any equipment, material, article, or patented process, by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition, and the Contractor may at his option, use any equipment, material, article, or process which, in the judgment of the Contracting Officer, is equal to that named. The Contractor shall furnish to the Contracting Officer for his approval the name of the manufacturer, the model number, and other identifying data and information respecting the performance, capacity, nature, and rating of the machinery and mechanical and other equipment which the Contractor contemplates incorporating in the work. When required by this contract or when called for by the Contracting Officer, the Contractor shall furnish the Contracting Officer for approval full information concerning the material or articles which he contemplates incorporating in the work. When so directed, samples shall be submitted for approval at the Contractor's expense, with all shipping charges prepared. Machinery, equipment, material, and articles installed or used without required approval shall be at the risk of subsequent rejection.

(b) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may, in writing, require the Contractor to remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable. (DAR 7-602.9)

10. INSPECTION AND ACCEPTANCE (1976 OCT)

(a) All work (which term includes but is not restricted to materials, workmanship, and manufacture and fabrication of components) shall be subject to inspection and test by the Government at all reasonable times and at all places prior to acceptance. Any such inspection and test is for the sole benefit of the Government and shall not relieve the Contractor of the responsibility of providing quality control measures to assure that the work strictly

complies with the contract requirements. No inspection or test by the Government shall be construed as constituting or implying acceptance. Inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance, nor in any way affect the continuing rights of the Government after acceptance of the completed work under the terms of paragraph (f) of this clause, except as hereinabove provided.

(b) The Contractor shall, without charge, replace any material or correct any workmanship found by the Government not to conform to the contract requirements, unless in the public interest the Government consents to accept such material or workmanship with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(c) If the Contractor does not promptly replace rejected material or correct rejected workmanship, the Government (1) may, by contract or otherwise, replace such material or correct such workmanship and charge the cost thereof to the Contractor, or (2) may terminate the Contractor's right to proceed in accordance with the clause of this contract entitled "Termination for Default--Damages for Delay--Time Extensions."

(d) The Contractor shall furnish promptly, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspection and test as may be required by the Contracting Officer. All inspection and test by the Government shall be performed in such manner as not unnecessarily to delay the work. Special, full size, and performance tests shall be performed as described in this contract. The Government reserves the right to charge to the Contractor any additional cost of inspection or test when material or workmanship is not ready at the time specified by the Contractor for inspection or test or when reinspection or retest is necessitated by prior rejection.

(e) Should it be considered necessary or advisable by the Government at any time before acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect, due to the fault of the Contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, and equitable adjustment shall be made in the contract price to compensate the Contractor for the additional services involved in such examination and reconstruction and, if completion of the work has been delayed thereby, he shall, in addition, be granted a suitable extension of time.

(f) Unless otherwise provided in this contract, acceptance by the Government shall be made as promptly as practicable after completion and inspection of all work required by this contract, or that portion of the work that the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except as regards latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Government's rights under any warranty or guarantee. (DAR 7-602.11)

11. SUPERINTENDENCE BY CONTRACTOR (1976 OCT)

The Contractor, at all times during performance and until the work is completed and accepted, shall give his personal superintendence to the work or have on the work a competent superintendent, satisfactory to the Contracting Officer and with authority to act for the Contractor. (DAR 7-602.12)

12. PERMITS AND RESPONSIBILITIES (1964 JUN)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any applicable Federal, State, and municipal laws, codes, and regulations, in connection with the prosecution of the work. He shall be similarly responsible for all damages to persons or property that occur as a result of his fault or negligence. He shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. He shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire construction work, except for any completed unit of construction thereof which theretofore may have been accepted. (DAR 7-602.13)

13. CONDITIONS AFFECTING THE WORK (1964 JUN)

The Contractor shall be responsible for having taken steps reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Any failure by the Contractor to do so will not relieve him from responsibility for successfully performing the work without additional expense to the Government. The Government assumes no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of this contract, unless such understanding or representations by the Government are expressly stated in the contract. (DAR 7-602.14)

14. OTHER CONTRACTS (1964 JUN)

The Government may undertake or award other contracts for additional work, and the Contractor shall fully cooperate with such other contractors and Government employees and carefully fit his own work to such additional work as may be directed by the Contracting Officer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or by Government employees. (DAR 7-602.15)

15. SHOP DRAWINGS (1976 OCT)

(a) The term "shop drawings" includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data; and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract.

(b) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate his approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate his approval or disapproval of the shop drawings and if not approved as submitted shall indicate his reasons therefor. Any work done prior to such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from any responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in (c) below.

(c) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation(s), he shall issue an appropriate contract modification, except that, if the variation is minor and does not involve a change in price or time of performance, a modification need not be issued.

(d) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated herein) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated herein) of all shop drawings will be retained by the Contracting Officer and one set will be returned to the Contractor. (DAR 7-602.54(a))

16. USE AND POSSESSION PRIOR TO COMPLETION (1976 OCT)

The Government shall have the right to take possession of or use any completed or partially completed part of the work. Prior to such possession or use, the Contracting Officer shall furnish the Contractor an itemized list of work remaining to be performed or corrected on such portions of the project as are to be possessed or used by the Government, provided that failure to list any item of work shall not relieve the Contractor of responsibility for compliance with the terms of the contract. Such possession or use shall not be deemed an acceptance of any work under the contract. While the Government has such possession or use, the Contractor, notwithstanding the provisions of the clause of this contract entitled "Permits and Responsibilities," shall be relieved of the responsibility for the loss or damage to the work resulting from the Government's possession or use. If such prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment in the contract price or the time of completion will be made and the contract shall be modified in writing accordingly. (DAR 7-602.39)

17. SUSPENSION OF WORK (1968 FEB)

(a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as he may determine to be appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Contracting Officer in the administration of this contract, or by his failure to act within the time specified in this contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such unreasonable suspension, delay or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent (1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or (2) for which an equitable adjustment is provided for or excluded under any other provision of this contract.

(c) No claim under this clause shall be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract. (DAR 7-602.46)

18. TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (1974 APR)

(a) The performance of work under this contract may be terminated by the Government in accordance with this clause in whole, or from time to time in part, whenever the Contracting Officer shall determine that such termination is in the best interest of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.

(b) After receipt of a Notice of Termination, and except as otherwise directed by the Contracting Officer, the Contractor shall:

(i) stop work under the contract on the date and to the extent specified in the Notice of Termination;

(ii) place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;

(iii) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;

(iv) assign to the Government, in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

(v) settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final for all the purposes of this clause;

(vi) transfer title and deliver to the Government, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer, (A) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the Notice of Termination, and (B) the completed or partially completed plans, drawings, information, and other property which, if the contract had been completed, would have been required to be furnished to the Government;

(vii) use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in (vi) above; provided, however, that the Contractor (A) shall not be required to extend credit to any purchaser, and (B) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer, and provided, further that the proceeds of any such transfer of disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;

(viii) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and

(ix) take such actions as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Government has or may acquire any interest.

At any time after expiration of the plant clearance period, as defined in Section VIII, Defense Acquisition Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same; provided, that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are sorted, within forty-five (45) days from the date of submission of the list, and any necessary adjustments to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer his termination claim, in the form and with certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than one year from the effective date of

termination, unless one or more extensions in writing are granted by the Contracting Officer, upon request of the Contractor made in writing within such one year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such one year period or any extension thereof. Upon failure of the Contractor to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

(d) Subject to the provisions of paragraph (c), the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this clause, which amount or amounts may include a reasonable allowance for profit or work done; provided, that such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in paragraph (e) of this clause, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Contracting Officer to agree upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this paragraph (d).

(e) In the event of the failure of the Contractor and the Contracting Officer to agree, as provided in paragraph (d), upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, the Contracting Officer shall pay to the Contractor the amounts determined by the Contracting Officer as follows, but without duplication of any amounts agreed upon in accordance with paragraph (d):

(i) with respect to all contract work performed prior to the effective date of the Notice of Termination, the total (without duplication of any items) of--

(A) the cost of such work;

(B) the cost of settling and paying claims arising out of the termination of work under subcontracts or orders as provided in paragraph (b)(v) above, exclusive of the amounts paid or payable on account of supplies or materials delivered or services furnished by the subcontractor prior to the effective date of the Notice of Termination of Work under this contract, which amounts shall be included in the cost on account of which payment is made under (A) above; and

(C) a sum, as profit on (A) above, determined by the Contracting Officer pursuant to 8-303 of the Defense Acquisition Regulation, in effect as of the date of execution of this contract, to be fair and reasonable; provided, however, that if it appears that the Contractor would have sustained a loss on

the entire contract had it been completed, no profit shall be included or allowed under this subdivision (C) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and

(ii) the reasonable cost of the preservation and protection of property incurred pursuant to paragraph (b)(ix); and any other reasonable cost incidental to termination of work under this contract, including expense incidental to the determination of the amount due to the Contractor as the result of the termination of work under this contract.

The total sum to be paid to the Contractor under (i) above shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. Except for normal spoilage, and except to the extent that the Government shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor under (i) above, the fair value, as determined by the Contracting Officer, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer pursuant to paragraph (b)(vii).

(f) Costs claimed, agreed to, or determined pursuant to (c), (d), (e), and (i) hereof shall be in accordance with Section XV of the Defense Acquisition Regulation as in effect on the date of this contract.

(g) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes," from any determination made by the Contracting Officer under paragraph (c), (e), or (i) hereof, except that if the Contractor has failed to submit his claim within the time provided in paragraph (c) or (i) hereof, and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer had made a determination of the amount due under paragraph (c), (e), or (i) hereof, the Government shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(h) In arriving at the amount due the Contractor under this clause there shall be deducted (i) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this contract, (ii) any claim which the Government may have against the Contractor in connection with this contract, and (iii) the agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the Government.

(i) If the termination hereunder be partial, the Contractor may file with the Contracting Officer a claim for an equitable adjustment of the price or prices specified in the contract relating to the continued portion of the contract (the portion not terminated by the Notice of Termination), and such equitable adjustment as may be agreed upon shall be made in such price or

prices. Any claim by the Contractor for an equitable adjustment under this clause must be asserted within ninety (90) days from the effective date of the termination notice, unless an extension is granted in writing by the Contracting Officer.

(j) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury pursuant to the Public Law 92-41, 85 STAT 97 for the Renegotiation Board, for the period from the date such excess payment is received by the Contractor to the date on which excess payment is received by the Contractor to the date on which excess is repaid to the Government; provided, however, that no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition, or such later date as determined by the Contracting Officer by reason of the circumstances.

(k) Unless otherwise provided for in this contract, or by applicable statute, the Contractor shall--from the effective date of termination until the expiration of three years after final settlement under this contract--preserve and make available to the Government at all reasonable times at the office of the Contractor but without direct charge to the Government, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under this contract and relating to the work terminated hereunder, or, to the extent approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions thereof. (DAR 7-602.29(a))

19. PRICING OF ADJUSTMENTS (1970 JUL)

When costs are a factor in any determination of a contract price adjustment pursuant to the "Changes" clause or any other provision of this contract, such costs shall be in accordance with Section XV of the Defense Acquisition Regulation as in effect on the date of this contract. (DAR 7-103.26)

20. PATENT INDEMNITY (1964 JUN)

Except as otherwise provided, the Contractor agrees to indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement upon any Letters Patent of the United States (except Letters Patent issued upon an application which is now or may hereafter be, for reasons of national security, ordered by the Government to be kept secret or otherwise withheld from issue) arising out of the performance of this contract or out of the use or disposal by or for the account of the Government of supplies furnished or construction work performed hereunder. (DAR 7-602.16)

21. ADDITIONAL BOND SECURITY (1976 OCT)

If any surety upon any bond furnished in connection with this contract becomes unacceptable to the Government, or if any such surety fails to furnish reports as to his financial condition from time to time as requested by the Government, or if the contract price is increased to such an extent that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer, the Contractor shall promptly furnish such additional security as may be required from time to time to protect the interests of the Government and of persons supplying labor or materials in the prosecution of the work contemplated by this contract. (DAR 7-602.17)

22. EXAMINATION OF RECORDS BY COMPTROLLER GENERAL (1975 JUN)

(a) This clause is applicable if the amount of this contract exceeds $10,000 and was entered into by means of negotiation, including small business restricted advertising, but is not applicable if this contract was entered into by means of formal advertising.

(b) The Contractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under this contract or such lesser time specified in either Appendix M of the Defense Acquisition Regulation or the Federal Procurement Regulations Part 1-20, as appropriate, have access to and the right to examine any directly pertinent books, documents, papers, and records of the Contractor involving transactions related to this contract.

(c) The Contractor further agrees to include in all his subcontracts hereunder a provision to the effect that the subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall. until the expiration of three years after final payment under the subcontract or such lesser time specified in either Appendix M of the Defense Acquisition Regulations Part 1-20, as appropriate, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor, involving transactions related to the subcontract. The term "subcontract" as used in this clause excludes (i) purchase orders not exceeding $10,000 and (ii) subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

(d) The periods of access and examination described in (b) and (c) above for records which relate to (i) appeals under the "Disputes" clause of this contract, (ii) litigation or the settlement of claims arising out of the performance of this contract, or (iii) costs and expenses of this contract as to which exception has been taken by the Comptroller General or any of his duly authorized representatives, shall continue until such appeals, litigation, claims or exceptions have been disposed of. (DAR 7-104.15)

23. BUY AMERICAN (1966 OCT)

(a) Agreement. In accordance with the Buy American Act (41 U.S.C. 10a-10d), the Contractor agrees that only domestic construction material will be

used (by the Contractor, subcontractors, materialmen, and suppliers) in the performance of this contract, except for nondomestic construction material listed in the "Nondomestic Construction Materials" clause, if any, of this contract.

(b) Domestic construction material. "Construction material" means any article, material, or supply brought to the construction site for incorporation in the building or work. An unmanufactured construction material is a "domestic construction material" if it has been mined or produced in the United States. A manufactured construction material is a "domestic construction material" if it has been manufactured in the United States and if the cost of its components which have been mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. "Component" means any article, material, or supply directly incorporated in a construction material.

(c) Domestic component. A component shall be considered to have been "mined, produced, or manufactured in the United States" (regardless of its source in fact) if the article, material, or supply in which it is incorporated was manufactured in the United States and the component is of a class or kind determined by the Government to be not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality. (DAR 7-602.20)

24. EQUAL OPPORTUNITY (1978 SEP)

(If, during any twelve (12) month period (including the twelve months preceding the award of this contract), the Contractor has been or is awarded federal contracts and/or subcontracts which have an aggregate value in excess of $10,000 the Contractor shall comply with (a) through (g) below. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.)

During the performance of this contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this Equal Opportunity clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided by the agency Contracting Officer, advising the labor union or workers' representative of the Contractor's commitments under this Equal Opportunity clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, and by the rules, regulations, and orders of the Secretary of Labor or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the Equal Opportunity clause of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of Paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interest of the United States. (DAR 7-103.18)

25. COVENANT AGAINST CONTINGENT FEES (1958 JAN)

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement of understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business.

For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee. (DAR 7-103-20)

26. OFFICIALS NOT TO BENEFIT (1964 JUN)

No member of Congress or resident Commissioner shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit. (DAR 7-602.19)

27. CONVICT LABOR (1975 OCT)

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment except as provided by Public Law 89-176, September 10, 1965 (18 U.S.C. 408(c)(2)) and Executive Order 11755, December 29, 1973. (DAR 7-104.17)

28. UTILIZATION OF SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS CONCERNS (1980 AUG)

(a) It is the policy of the United States that small business and small business concerns owned and controlled by socially and economically disadvantaged individuals shall have the maximum practicable opportunity to participate in the performance of contracts let by any Federal agency.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with the efficient performance of this contract. The term "subcontract" means any agreement (other than one involving an employer-employee relationship) to be entered into by a Federal Government prime contractor or subcontractor calling for supplies or services required for the performance of the original contract or subcontract. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

(c) As used in this contract, the term "small business concern" shall mean a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals," hereafter referred to as disadvantaged business, shall mean a small business concern -

(1) which is at least 51 per centum owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 per centum of the stock of which is owned by one or more socially and economically disadvantaged individuals; and

(2) whose management and daily business operations are controlled by one or more of such individuals. The Contractor shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans (i.e., American Indians, Eskimos, Aleuts and Native Hawaiians), Asian-Pacific Americans (i.e., U.S. citizens whose origins are from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, and Taiwan, and other minorities, or any individuals found to be disadvantaged by the Administration pursuant to Section 8(a) of the Small Business Act.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as either a small business concern or a small business concern owned and controlled by socially and economically disadvantaged individuals. (DAR 7-104.14)

29. FEDERAL, STATE, AND LOCAL TAXES (1971 NOV)

(a) Except as may be otherwise provided in this contract, the contract price includes all applicable Federal, State, and local taxes and duties.

(b) Nevertheless, with respect to any Federal excise tax or duty on the transactions or property covered by this contract, if a statute, court decision, written ruling, or regulation takes effect after the contract date and--

(1) results in the Contractor being required to pay or bear the burden of any such Federal excise tax or duty or increase in the rate thereof which would not otherwise have been payable on such transactions or property, the contract price shall be increased by the amount of such tax or duty or rate increase, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price as a contingency reserve or otherwise; or

(2) results in the Contractor not being required to pay or bear the burden of, or in his obtaining a refund or drawback of, any such Federal excise tax or duty which would otherwise have been payable on such transactions or property or which was the basis of an increase in the contract price, the contract price shall be decreased by the amount of the relief, refund, or drawback, or that amount shall be paid to the Government, as directed by the Contracting Officer. The contract price shall be similarly decreased if the Contractor, through his fault or negligence or his failure to follow instructions of the Contracting Officer, is required to pay or bear the burden of, or does not obtain a refund or drawback of, any such Federal excise tax or duty.

(c) Paragraph (b) above shall not be applicable to social security taxes or to any other employment tax.

(d) No adjustment of less than $100 shall be made in the contract price pursuant to paragraph (b) above.

(e) As used in paragraph (b) above, the term "contract date" means the date set for bid opening, or if this is a negotiated contract, the contract date. As to additional supplies or services procured by modification to this contract, the term "contract date" means the date of such modification.

(f) Unless there does not exist any reasonable basis to sustain an exemption, the Government upon the request of the Contractor shall, without further liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax; provided, that evidence appropriate to establish exemption from any Federal excise tax or duty which may give rise to either an increase or decrease in the contract price will be furnished only at the discretion of the Government.

(g) The Contractor shall promptly notify the Contracting Officer of matters which will result in either an increase or decrease in the contract price, and shall take action with respect thereto as directed by the Contracting Officer. (DAR 7-103.10(a))

30. CONTRACTOR INSPECTION SYSTEM (1964 NOV)

The Contractor shall (i) maintain an adequate inspection system and perform such inspections as will assure that the work performed under the contract conforms to contract requirements, and (ii) maintain and make available to the Government adequate records of such inspection. (DAR 7-602.10)

31. GRATUITIES (1952 MAR)

(a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this contract is terminated as provided in paragraph (a) hereof, the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the cost incurred by the Contractor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract. (DAR 7-602.25)

32. NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (1965 JAN)

The provisions of this clause shall be applicable only if the amount of this contract exceeds $10,000.

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail each notice or claim of patent or copyright infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed hereunder, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) This clause shall be included in all subcontracts. (DAR 7-103.23)

33. AUTHORIZATION AND CONSENT (1964 MAR)

The Government hereby gives its authorization and consent (without prejudice to its rights of indemnification, if such rights are provided for in the contract) for all use and manufacture, in the performance of this contract or any part thereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract), of any patented invention (i) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract, or (ii) utilized in the machinery, tools, or methods the use of which necessarily results from compliance by the Contractor or the using subcontractor with (a) specifications or written provisions now or hereafter forming a part of this contract, or (b) specific written instructions given by the OICC directing the manner of performance. The Contractor's entire liability to the Government for patent infringement shall be determined solely by the provisions of the indemnity clause, if any, included in the contract and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted. (DAR 7-103.22)

34. COMPOSITION OF CONTRACTOR (1965 JAN)

If the Contractor hereunder is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder. (DAR 7-602.32)

35. SITE INVESTIGATION (1965 JAN)

The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river states, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character,

quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from information presented by the drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Government. (DAR 7-602.33)

36. PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS (1965 JAN)

(a) The Contractor will preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site of work which is not to be removed and which does not unreasonably interfere with the construction work. Care will be taken in removing trees authorized for removal to avoid damage to vegetation to remain in place. Any limbs or branches of trees broken during such operations or by the careless operation of equipment, or by workmen, shall be trimmed with a clean cut and painted with an approved tree pruning compound as directed by the Contracting Officer.

(b) The Contractor will protect from damage all existing improvements or utilities at or near the site of the work, the location of which is made known to him, and will repair or restore any damage to such facilities, resulting from failure to comply with the requirements of this contract or the failure to exercise reasonable care in the performance of the work. If the Contractor fails or refuses to repair any such damage promptly, the Contracting Officer may have the necessary work performed and charge the cost thereof to the Contractor. (DAR 7-602.34)

37. OPERATIONS AND STORAGE AREAS (1965 JAN)

(a) All operations of the Contractor (including storage of materials) upon Government premises shall be confined to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by his operations.

(b) Temporary buildings (storage sheds, shops, offices, etc.) may be erected by the Contractor only with the approval of the Contracting Officer, and shall be built with labor and materials furnished by the Contractor without expense to the Government. Such temporary buildings and utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the work. With the written consent of the Contracting Officer, such buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways or construct and use such temporary roadways as may be authorized by the Contracting Officer. Where materials are

transported in the prosecution of the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State or local law or regulation. When it is necessary to cross curbings or sidewalks, protection against damage shall be provided by the Contractor and any damaged roads, curbings, or sidewalks shall be repaired by or at the expense of the Contractor. (DAR 7-602.35)

38. MODIFICATION PROPOSALS -- PRICE BREAKDOWN (1968 APR)

The Contractor, in connection with any proposal he makes for a contract modification, shall furnish a price breakdown, itemized as required by the Contracting Officer. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the modification, whether such work was deleted, added or changed. Any amount claimed for subcontracts shall be supported by a similar price breakdown. In addition, if the proposal includes a time extension, a justification thereof shall also be furnished. The proposal, together with the price breakdown and time extension justification, shall be furnished by the date specified by the Contracting Officer. (DAR 7-602.36)

39. SUBCONTRACTORS (1979 MAR)

Within seven days after the award of any subcontract either by himself or a subcontractor, the Contractor shall deliver to the Contracting Officer a completed DD Form 1566. The form shall include the subcontractor's acknowledgement of the inclusion in his subcontract of the clauses of this contract entitled, "Davis-Bacon Act," "Contract Work Hours and Safety Standards Act - Overtime Compensation," "Apprentices and Trainees," "Compliance with Copeland Regulations," "Withholding of Funds," "Subcontracts," "Contract Termination - Debarment," and "Payrolls and Basic Records." Nothing contained in this contract shall create any contractual relation between the subcontractor and the Government. (DAR 7-602.37)

40. CLEANING UP (1965 JAN)

The Contractor shall at all times keep the construction area, including storage areas used by him, free from accumulations of waste material or rubbish and prior to completion of the work remove any rubbish from the premises and all tools, scaffolding, equipment, and materials not the property of the Government. Upon completion of the construction the Contractor shall leave the work and premises in a clean, neat and workmanlike condition satisfactory to the Contracting Officer. (DAR 7-602.40)

41. ADDITIONAL DEFINITIONS (1965 JAN)

(a) Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription" of the Contracting Officer is

intended and similarly the words "approved," "acceptable," "satisfactory" or words of like import shall mean "approved by" or "acceptable to" or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(b) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provided complete in place," that is "furnished and installed." (DAR 7-602.41)

42. ACCIDENT PREVENTION (1977 JUN)

(a) In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract, the Contractor shall comply with all pertinent provisions of Corps of Engineers Manual, EM 385 1-1, dated 1 June 1977 entitled "General Safety Requirements," as amended, and will also take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for the purpose.

(b) The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, exposure data and all accidents resulting in death, traumatic injury, occupational disease, and damage to property, materials, supplies and equipment incident to work performed under this contract.

(c) The Contracting Officer will notify the Contractor of any noncompliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

(d) Compliance with the provisions of this article by subcontractors will be the responsibility of the Contractor.

If the contract involves more than 6 months work or is described as hazardous character in the Invitation for Bids, Schedule, or Specifications, the following paragraph (e) will apply.

(e) Prior to commencement of the work the Contractor will:

(1) submit in writing his proposals for effectuating this provision for accident prevention;

(2) meet in conference with representatives of the Contracting Officer to discuss and develop mutual understandings relative to administration of the overall safety program. (DAR 7-602.42)

43. GOVERNMENT INSPECTORS (1965 JAN)

The work will be conducted under the general direction of the Contracting Officer and is subject to inspection by his appointed inspectors to insure strict compliance with the terms of the contract. No inspector is authorized to change any provision of the specifications without written authorization of the Contracting Officer, nor shall the presence or absence of an inspector relieve the Contractor from any requirements of the contract. (DAR 7-602.43)

44. RIGHTS IN SHOP DRAWINGS (1966 APR)

(a) Shop drawings for construction means drawings submitted to the Government by the Construction Contractor, subcontractor or any lower tier subcontractor pursuant to a construction contract, showing in detail (i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier. (DAR 7-602.47)

45. PRIORITIES, ALLOCATIONS, AND ALLOTMENTS (1975 OCT)

(The following clause is applicable to rateable contracts.)

The Contractor shall follow the provisions of DMS Reg. 1 or DPS Reg. 1 and all other applicable regulations and orders of the Bureau of Domestic Commerce in obtaining controlled materials and other products and materials needed to fill this order. (DAR 7-104.18)

46. PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA--PRICE ADJUSTMENTS (1970 JAN)

(a) This clause shall become operative only with respect to any modification of this contract which involves aggregate increases and/or decreases in costs plus applicable profits in excess of $100,000 unless the modification is priced on the basis of adequate competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation. The right to price reduction under this clause is limited to defects in data relating to such modification.

(b) If any price, including profit or fee, negotiated in connection with any price adjustment under this contract was increased by any significant sums because:

(i) the Contractor furnished cost or pricing data which was not complete, accurate and current as certified in the Contractor's Certificate of Current Cost or Pricing Data;

(ii) a subcontractor, pursuant to the clause of this contract entitled "Subcontractor Cost or Pricing Data" or "Subcontractor Cost or Pricing

Data--Price Adjustments" or any subcontract clause therein required, furnished cost or pricing data which was not complete, accurate and current as certified in the subcontractor's Certificate of Current Cost or Pricing Data:

(iii) a subcontractor or prospective subcontractor furnished cost or pricing data which was required to be complete, accurate and current and to be submitted to support a subcontract cost estimate furnished by the Contractor but which was not complete, accurate and current as of the date certified in the Contractor's Certificate of Current Cost or Pricing Data; or

(iv) the Contractor or a subcontractor or prospective subcontractor furnished any data, not within (i), (ii) or (iii) above, which was not accurate, as submitted; the price shall be reduced accordingly and the contract shall be modified in writing as may be necessary to reflect such reduction. However, any reduction in the contract price due to defective subcontract data of a prospective subcontractor, when the subcontract was not subsequently awarded to such subcontractor, will be limited to the amount (plus applicable overhead and profit markup) by which the actual subcontract, or actual cost to the Contractor if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor, provided the actual subcontract price was not affected by defective cost or pricing data.

Note: Since the contract is subject to reduction under this clause by reason of defective cost or pricing data submitted in connection with certain subcontracts, it is expected that the Contractor may wish to include a clause in each such subcontract requiring the subcontractor to appropriately indemnify the Contractor. However, the inclusion of such a clause and the terms thereof are matters for negotiation and agreement between the Contractor and the subcontractor, provided that they are consistent with DAR 23-203 relating to Disputes provisions in subcontracts. It is also expected that any subcontractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data required to be submitted by his lower tier subcontractors. (DAR 7-104.29(b))

47. AUDIT BY DEPARTMENT OF DEFENSE (1978 AUG)

(The following clause is applicable unless this contract was entered into by formal advertising and is not in excess of $100,000.)

(a) General. The Contracting Officer or his representatives shall have the audit and inspection rights described in the applicable paragraphs (b), (c) and (d) below.

(b) Examination of Costs. If this is a cost reimbursement type, incentive, time and materials, labor hour, or price redeterminable contract, or any combination thereof, the Contractor shall maintain, and the Contracting Officer or his representatives shall have the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to reflect properly all direct and indirect costs of whatever nature claimed to have been incurred and anticipated to be incurred for the performance of this contract. Such right of examination shall include inspection at all reasonable times of the Contractor's plants, or such parts thereof, as may be engaged in the performance of this contract.

(c) Cost or Pricing Date. If the Contractor submitted cost or pricing data in connection with the pricing of this contract or any change or modification thereto, unless such pricing was based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, the Contracting Officer or his representatives who are employees of the United States Government shall have the right to examine all books, records, documents and other data of the Contractor related to the negotiation, pricing or performance of such contract, change or modification, for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. Additionally, in the case of pricing any change or modification exceeding $100,000 to formally advertised contracts, the Comptroller General of the United States or his representatives who are employees of the United States Government shall have such rights. The right of examination shall extend to all documents necessary to permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.

(d) Reports. If the Contractor is required to furnish Contractor Cost Data Reports (CCDR), Contract Fund Status Reports (CFSR), or Cost Performance Reports (CPR), the Contracting Officer or his representatives shall have the right to examine books, records, other documents, and supporting materials, for the purpose of evaluating (i) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports, and (ii) the data reported.

(e) Availability. The materials described in (b), (c) and (d) above shall be made available at the office of the Contractor, at all reasonable times, for inspection, audit, or reproduction, until the expiration of three years from the date of final payment under this contract or such lesser time specified in Appendix M of the Defense Acquisition Regulation, and for such longer period, if any, as is required by applicable statute, or by other clauses of this contract, or by (1) and (2) below:

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for a period of three years from the date of any resulting final settlement.

(2) Records which relate to appeals under the "Disputes" clause of this contract, or litigation or the settlement of claims arising out of the performance of this contract, shall be made available until such appeals, litigation, or claims have been disposed of.

(f) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (f), in all subcontracts exceeding $10,000 hereunder, except altered as necessary for proper identification of the contracting parties and the Contracting Officer under the Government prime contract. (DAR 7-104.41)

48. SUBCONTRACTOR COST OR PRICING DATA--PRICE ADJUSTMENTS (1970 JAN)

(a) Paragraphs (b) and (c) of this clause shall become operative only with respect to any modification made pursuant to one or more provisions of

this contract which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed $100,000. The requirements of this clause shall be limited to such modifications.

(b) The Contractor shall require subcontractors hereunder to submit cost or pricing data under the following circumstances: (i) prior to the award of any subcontract the amount of which is expected to exceed $100,000 when entered into; (ii) prior to the pricing of any subcontract modification which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed $100,000; except where the price is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation.

(c) The Contractor shall require subcontractors to certify that to the best of their knowledge and belief the cost and pricing data submitted under (b) above is accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract change or modification.

(d) The Contractor shall insert the substance of this clause including this paragraph (d) in each subcontract which exceeds $100,000. (DAR 7-104.42(b))

49. INTEREST (1972 MAY)

Notwithstanding any other provision of this contract, unless paid within 30 days all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code) shall bear interest from the date due until paid and shall be subject to adjustments as provided by Part 6 of Appendix E of the Defense Acquisition Regulation, as in effect on the date of this contract. The interest rate per annum shall be the interest rate in effect which has been established by the Secretary of the Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board, as of the date the amount becomes due as herein provided. Amounts shall be due upon the earliest one of (i) the date fixed pursuant to this contract; (ii) the date of the first written demand for payment, consistent with this contract, including demand consequent upon default termination; (iii) the date of transmittal by the Government to the Contractor of a proposed supplemental agreement to confirm completed negotiations fixing the amount; or (iv) if this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or in connection with a negotiated pricing agreement not confirmed by contract supplement. (DAR 7-104.39)

50. GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (1964 NOV)

(a) The Government shall deliver to the Contractor, for use only in connection with this contract, the property described in the schedule or specifications (hereinafter referred to as "Government-furnished property"), at the times and locations stated therein. If the Government-furnished property, suitable for its intended use, is not so delivered to the Contractor, the

Contracting Officer shall, upon timely written request made by the Contractor, and if the facts warrant such action, equitably adjust any affected provision of this contract pursuant to the procedures of the "Changes" clause hereof.

(b) Title to Government-furnished property shall remain in the Government. The Contractor shall maintain adequate property control records of Government-furnished property in accordance with sound industrial practice.

(c) Unless otherwise provided in this contract, the Contractor, upon delivery to him of any Government-furnished property, assumes the risk of, and shall be responsible for, any loss thereof or damage thereto except for reasonable wear and tear, and except to the extent that such property is consumed in the performance of this contract.

(d) The Contractor shall, upon completion of this contract, prepare for shipment, deliver f.o.b. origin, or dispose of all Government-furnished property not consumed in the performance of this contract or not therefore delivered to the Government, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or paid in such other manner as the Contracting Officer may direct. (DAR 7-104.24(f))

51. VARIATIONS IN ESTIMATED QUANTITIES (1968 APR)

Where the quantity of a pay item in this contract is an estimated quantity and where the actual quantity of such pay item varies more than fifteen percent (15%) above or below the estimated quantity stated in this contract, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon an increase or decrease in costs due solely to the variation above one hundred fifteen percent (115%) or below eighty-five percent (85%) of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contracting Officer shall, upon receipt of a written request for an extension of time within ten (10) days from the beginning of such delay, or within such further period of time which may be granted by the Contracting Officer prior to the date of final settlement of the contract, ascertain the facts and make such adjustment for extending the completion date as in his judgment the findings justify. (DAR 7-603.27)

52. SALVAGE MATERIALS AND EQUIPMENT (1965 JAN)

The Contractor shall maintain adequate property control records for all materials or equipment specified to be salvaged. These records may be in accordance with the Contractor's system of property control, if approved by the property administrator. The Contractor shall be responsible for the adequate storage and protection of all salvaged materials and equipment and shall replace, at no cost to the Government, all salvage materials and equipment which are broken or damaged during salvage operations as the result of his negligence, or while in his care. (DAR 7-603.29)

53. AVAILABILITY AND USE OF UTILITY SERVICES (1967 APR)

This clause shall be applicable only if so expressly stated in the Schedule, or specification, or Invitation for Bids.

(a) The Government will make available to the Contractor, from existing outlets and supplies, all reasonably required amounts of utilities as specified in the Schedule or specifications. Except as otherwise provided in the Schedule or specifications, each utility shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates as determined by the Contracting Officer.

(b) The Contractor shall carefully conserve utilities furnished without charge. The Contractor, at his own expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines and, if necessary to determine charges, all meters required to measure the amount of each utility used; and he shall remove the same prior to final acceptance of the construction. (DAR 7-603.30)

54. MISPLACED MATERIAL (1965 JAN)

Should the Contractor, during the progress of the work lose, dump, throw overboard, sink, or misplace any material, plant, machinery, or appliance, which in the opinion of the Contracting Officer may be dangerous to or obstruct navigation, the Contractor shall recover and remove the same with the utmost dispatch. The Contractor shall give immediate notice, with description and location of such obstructions, to the Contracting Officer or inspector, and when required shall mark or buoy such obstructions until the same are removed. Should he refuse, neglect, or delay compliance with the above requirements, such obstructions may be removed by the Contracting Officer, and the cost of such removal may be deducted from any money due or to become due the Contractor, or may be recovered under his bond. The liability of the Contractor for the removal of a vessel wrecked or sunk without fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the River and Harbor Act of March 3, 1899. (33 U.S.C. 410 et seq.) (DAR 7-603.32)

55. SIGNAL LIGHTS (1965 JAN)

The Contractor shall display signal lights and conduct his operations in accordance with the General Regulations of the Department of the Army and of the Coast Guard governing lights and day signals to be displayed by towing vessels with tows on which no signals can be displayed, vessels working on wrecks, dredges, and vessels engaged in laying cables or pipe or in submarine or bank protection operations, lights to be displayed on dredge pipe lines, and day signals to be displayed by vessels of more than 65 feet in length moored or anchored in a fairway or channel, and the passing by other vessels of floating plant working in navigable channels, as approved by the Secretary of the Army (33 C.F.R. 201.1-201.16) and the Commandant, U.S. Coast Guard (33 C.F.R. 80.18-31a and 33 C.F.R. 95.51-95.70). (DAR 7-603.33)

56. IDENTIFICATION OF EMPLOYEES (1965 JAN)

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display such identification as may be approved and directed by the Contracting Officer. All prescribed identification shall immediately be delivered to the Contracting Officer, for cancellation upon the release of any employee. When required by the Contracting Officer the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project. (DAR 7-603.34)

57. TIME EXTENSIONS (1965 JAN)

Notwithstanding any other provisions of this contract it is mutually understood that the time extensions for changes in the work will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion dates for all other portions of the work will not be altered and may further provide for an equitable readjustment of liquidated damages pursuant to the new completion schedule. (DAR 7-603.36)

58. RESERVED

59. PROGRESS CHARTS AND REQUIREMENTS FOR OVERTIME WORK (1965 JAN)

(a) The Contractor shall within 5 days or within such time as determined by the Contracting Officer, after date of commencement of work, prepare and submit to the Contracting Officer for approval a practicable schedule, showing the order in which the Contractor proposes to carry on the work, the date on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule may be in any form, at the option of the Contractor, but shall maintain current with each submittal, at least the following information:

(1) The various classes and areas of work, broken down into:

(a) Times projected for submittals, approvals, and procurement.

(b) Times for installation and erection.

(c) Times for testing and inspection.

(2) The work completed and the work remaining to be done to complete the project.

(3) Any items of work which will delay the start or completion of other major items of work so as to delay completion of the whole project.

The Contractor shall submit an updated copy of his schedule with each invoice, and when required by major changes in the work. If the Contractor fails to

submit a progress schedule within the time herein prescribed, the Contracting Officer may withhold approval of progress payments until such time as the Contractor submits the required progress schedule.

(b) If, in the opinion of the Contracting Officer, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may require him to increase the number of shifts, or overtime operations, days of work, or the amount of construction planned or all of them, and to submit for approval such supplementary schedule or schedules in chart form as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Government.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this provision shall be grounds for determination by the Contracting Officer that the Contractor is not prosecuting the work with such diligence as will insure completion within the time specified. Upon such determination the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part thereof, in accordance with the clause of the contract entitled "Termination for Default-Damages for Delay-Time Extensions." (DAR 7-603.48)

60. PERFORMANCE OF WORK BY CONTRACTOR (1965 JAN)

The Contractor shall perform on the site, and with his own organization, work equivalent to at least 20 percent of the total amount of the work to be performed under the contract. If during the progress of the work the Contractor requests a reduction in such percentage and the Officer in Charge of Construction determines that it would be to the Government's advantage, the percentage of the work hereunder required to be performed by the Contractor may be reduced, provided written approval of such reduction is obtained from the Officer in Charge of Construction. (DAR 7-603.15)

61. LAYOUT OF WORK (1965 JAN)

The Contractor shall layout his work from Government-established base lines and bench marks indicated on the drawings and shall be responsible for all measurements in connection therewith. The Contractor shall furnish, at his own expense, all stakes, templates, platforms, equipment, tools, and materials and labor as may be required in laying out any part of the work from the base lines and bench marks established by the Government. The Contractor will be held responsible for the execution of the work to such lines and grades as may be established or indicated by the Officer in Charge of Construction. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Officer in Charge of Construction until authorized to remove them. If such marks are destroyed, by the Contractor or through his negligence, prior to their authorized removal, they may be replaced by the Officer in Charge of Construction at his discretion. The expense of replacement will be deducted from any amounts due or to become due the Contractor. (DAR 7-604.3)

62. WARRANTY OF CONSTRUCTION (1974 APR)

(a) In addition to any other warranties set out elsewhere in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or design furnished, or workmanship performed by the Contractor or any of his subcontractors or suppliers at any tier. Such warranty shall continue for a period of one year from the date of final acceptance of the work, but with respect to any part of the work which the Government takes possession of prior to final acceptance, such warranty shall continue for a period of one year from the date the Government takes possession. Under this warranty, the Contractor shall remedy at his own expense any such failure to conform or any such defect. In addition, the Contractor shall remedy at his own expense any damage to Government owned or controlled real or personal property, when that damage is the result of the Contractor's failure to conform to contract requirements or any such defect of equipment, material, workmanship, or design. The Contractor shall also restore any work damaged in fulfilling the terms of this clause. The Contractor's warranty with respect to work repaired or replaced hereunder will run for one year from the date of such repair or replacement.

(b) The Government shall notify the Contractor in writing within a reasonable time after the discovery of any failure, defect, or damage.

(c) Should the Contractor fail to remedy any failure, defect, or damage described in (a) above within a reasonable time after receipt of notice thereof, the Government shall have the right to replace, repair, or otherwise remedy such failure, defect, or damage at the Contractor's expense.

(d) In addition to the other rights and remedies provided by this clause, all subcontractors', manufacturers', and suppliers' warranties, expressed or implied, respecting any work and materials shall, at the direction of the Government, be enforced by the Contractor for the benefit of the Government. In such case if the Contractor's warranty under (a) above has expired, any suit directed by the Government to enforce a subcontractor's, manufacturer's, or supplier's warranty shall be at the expense of the Government. The Contractor shall obtain any warranties which the subcontractors, manufacturers, or suppliers would give in normal commercial practice.

(e) If directed by the Contracting Officer, the Contractor shall require any such warranties to be executed in writing to the Government.

(f) Notwithstanding any other provision of this clause, unless such a defect is caused by the negligence of the Contractor or his subcontractors or suppliers at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage which results from any such defect in Government furnished material or design.

(g) The warranty specified herein shall not limit the Government's rights under the "Inspection and Acceptance" clause of this contract with respect to latent defects, gross mistake, or fraud.

(h) Defects in design or manufacture of equipment specified by the Government on a "brand name and model" basis, shall not be included in this warranty. The Contractor shall require any subcontractors, manufacturers, or suppliers thereof to execute their warranties in writing directly to the Government. (DAR 7-604.4)

63. VALUE ENGINEERING INCENTIVE - CONSTRUCTION (1980 DEC)

(This provision is applicable if the contract price is $100,000 or more.)

(a) Applicability. This clause applies to any Contractor developed, prepared, and submitted Value Engineering Change Proposal (VECP).

(b) Definitions.

(1) "Contractor's development and implementation costs" means those costs incurred on a VECP before Government acceptance and those costs the Contractor incurs specifically to make the changes required by Government acceptance of a VECP.

(2) "Government costs" means those agency costs that result directly from developing and implementing the VECP and any net increases in the cost of testing, operations, maintenance, and logistic support. They do not include the normal administrative costs of processing the VECP.

(3) "Instant contract savings" means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs (including subcontractors' development and implementation costs). (See paragraph (g).)

(4) "Value Engineering Change Proposal (VECP)" means a proposal that:

(i) requires a change to this, the instant contract, to implement; and
(ii) results in reducing the contract price or estimated cost without impairing essential functions or characteristics, provided that it does not involve a change in deliverable end-item quantities only.

(c) VECP Preparation. As a minimum, the Contractor shall include the information described in (1) through (6) in each VECP. If the proposed change affects contractually required configuration management procedures, the instructions in the procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.

(2) A list of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) A separate, detailed cost estimate for both the affected portions of the existing contract requirement and the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (g). The Contractor shall also include a description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(4) A projection of any effects the proposed change would have on collateral costs to the agency.

(5) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(6) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submissions.

(1) The Contractor shall submit VECPs to the Resident Engineer at the worksite, with a copy to the Contracting Officer. The Contracting Officer shall notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required because of extenuating circumstances, the Contractor shall be notified within the 45-day period and provided the reason for the delay and the expected date of the Contracting Officer's decision. VECPs shall be processed expeditiously; however, the Government shall not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer shall provide the Contractor written notification fully explaining the reasons for rejection. The Contractor may withdraw, in whole or in part, any VECP not accepted by the Government within the period specified in the VECP. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(e) Acceptance. Any VECP may be accepted in whole or in part by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The Contracting Officer's decision to accept all or part of any VECP shall be final and not subject to the Disputes clause.

(f) Sharing.

(1) Rates. The Contractor's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by 55 percent for fixed-price contracts and 25 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to:

(i) accept the VECP;

(ii) reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) provide the Contractor's share of savings by adding the amount calculated in (f)(1) to the contract price or fee.

(g) Subcontracts. The Contractor shall include appropriate VE clauses in any subcontract of $50,000 or more and may include them in subcontracts of lesser value. To compute any adjustment in the contract price under paragraph (f), the Contractor's VECP development and implementation costs shall include any subcontractor's development and implementation costs that clearly result from the VECP, but shall exclude any VE incentive payments to subcontractors. The Contractor may choose any arrangement for subcontractor VE incentive payments, provided that these payments are not made from the Government's share of the savings resulting from the VECP.

(h) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering Incentive--Construction clause of Contract _____, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a VECP submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (DAR 7-602.50)

64. VALUE ENGINEERING COST COMPUTATION (1-75)

In computing the instant contract savings to the Contractor (ICS), under Clause 66, "Value Engineering Incentive (1977 Aug)," there shall not be taken into consideration any Value Engineering incentive payments which the Contractor may make to the subcontractor, i.e., such amounts will not be deemed a development and implementation cost at any tier.

65. REQUIRED INSURANCE (1977 JAN)

(a) The Contractor shall procure and maintain during the entire period of this performance under this contract the following minimum insurance.

COVERAGE

Type of Insurance	Per Person	Per Accident	Property
1. Comprehensive General Liability	$300,000	$1,000,000	$100,000
2. Automobile Liability	$300,000	$1,000,000	$100,000
3. Workmen's	As required		
4. (Other as required by State Law)			

(b) Prior to commencement of work hereunder, the Contractor shall furnish to the Contracting Officer a certificate or written statement of the above required insurance. The policies evidencing required insurance shall contain an endorsement to the effect that cancellation or any material change in the policies adversely affecting the interests of the Government in such insurance shall not be effective for such period as may be prescribed by the laws of the State in which this contract is to be performed and in no event less than thirty (30) days after written notice thereof to the Contracting Officer.

(c) The Contractor agrees to insert the substance of this clause, including this paragraph (c), in all subcontracts hereunder. (DAR 7-603.10)

66. GOVERNMENT REPRESENTATIVES (6-72)

(a) The work will be under the general direction of the Contracting Officer, the Commander, Naval Facilities Engineering Command, who shall designate an officer of the Civil Engineer Corps, United States Navy, or other officer or representative of the Government, as Officer in Charge of Construction, referred to as the "OICC," who except in connection with the "Disputes" clause shall be the authorized representative of the Contracting Officer and under the direction of the Contracting Officer have complete charge of the work, and shall exercise full supervision and general direction of the work, so far as it affects the interest of the Government. For the purposes of the

"Disputes" clause the Contracting Officer shall mean the Commander, Naval Facilities Engineering Command, the Acting Commander, their successors, or their representatives specially designated for this purpose.

(b) The provisions in this clause or elsewhere in this contract regarding supervision, approval or direction by the Contracting Officer or the OICC or action taken pursuant thereto are not intended to and shall not relieve the Contractor of responsibility for the accomplishment of the work either as regards sufficiency or the time of performance, except as expressly otherwise provided herein.

67. SPECIFICATIONS AND DRAWINGS (6-72)

To Clause 2 add the following paragraphs:

(b) Omissions and Misdescriptions. Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of work but they shall be performed as if fully and correctly set forth, and described in the drawings and specifications.

(c) Deviations. Deviations from the drawings and dimensions therein given, whether or not error is believed to exist, shall be made only after written authority is obtained from the OICC.

68. PRECEDENCE (6-72)

In the event of conflict or inconsistency between any of the provisions of the various portions of this contract (the reconciliation of which is not otherwise provided for here), precedence shall be given in the following order, the provisions of any particular portion prevailing over those of a subsequently listed portion.

(1) Typewritten portions of the contract.

(2) the specifications referred to in Standard Form 23 (including all addenda, and mechanical and technical but not contractual aspects of incorporated provisions) as specifically amended herein, if amended.

(3) printed provisions of the contract form, including printed provisions of added slip sheets.

69. ORAL MODIFICATION (6-72)

No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this contract.

70. NO WAIVER BY GOVERNMENT (6-72)

The failure of the Government in any one or more instances to insist upon the strict performance of any of the terms of this contract or to exercise any option herein conferred, shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon such terms or option on any future occasion.

71. SUPERSEDURE (6-72)

If this contract has been preceded by a Letter or Dispatch of Intent or a Notice of Award, anticipating the execution of this contract then such Letter or Dispatch or Notice and all rights and obligations of the parties thereunder are superseded and merged into this contract. All acts of the Contractor and the Government and all payments, if any, made by the Government under said Letter or Dispatch or Notice shall be deemed to have been under this contract.

72. SANITATION (6-72)

Adequate sanitary conveniences of any approved type for the use of persons employed on the work, and properly secluded from public observation, shall be constructed and maintained by the Contractor in such a manner and at such points as shall be required or approved by the OICC. These conveniences shall be maintained at all times without nuisance and their use shall be strictly enforced. Upon completion of the work they shall be removed from the premises, leaving the premises clean and free from nuisance.

73. TESTING FOUNDATIONS (6-72)

Tests of the bearing value of the material underlying the foundation of the structure to be built shall be made at such times and places and in such a manner as may be directed by the OICC. As far as practicable, test piles, when used, shall be so located that they can become part of the finished structure. The Contractor shall furnish OICC ample opportunity for viewing tests and making such records as the latter may consider advisable. The Contractor shall be entitled to compensation for making such tests in the same manner as for a change required by the OICC under Clause 3 to the extent the contract price does not include compensation therefor. Notice must be given of intention to request compensation in accordance with Clause 3.

74. PAYMENT TO CONTRACTOR (6-72)

(a) To Clause 7 add the following sentence at the end of paragraph (a) and add paragraph (g) below:

Such payments shall be made on submission of itemized requests by the Contractor and shall be subject to reduction for overpayments or increase for underpayments on preceding payments to the Contractor.

(g) The obligation of the Government to make any of the payments required under any of the provisions of this contract shall, in the discretion of the OICC, be subject to (1) reasonable deductions on account of defects in material or workmanship, and (2) any claims which the Government may have against the Contractor under or in connection with this contract. Any overpayments to the Contractor shall, unless otherwise adjusted, be repaid to the Government upon demand.

75. CHANGES BOARD AND ESTIMATES (6-72)

In determining any equitable adjustment under Clause 3, the OICC shall, in those instances where the adjustment to be made in compensation is estimated by the OICC to amount to $25,000 or more, convene, and give full consideration to the report of an advisory board of three members, consisting of two Government representatives appointed by the OICC and one representative appointed by the Contractor. This board shall estimate and report to the OICC the amount of the change in cost, time, or both, resulting from the ordered change. In making all equitable adjustments under Clause 3, compensation for additions will be based upon estimated costs at the time the work is performed and credit for deductions will be based upon estimated costs at the time the contract was made. To such cost estimates, 6 percent shall be added to adjust the Contractor's profits. In arriving at the amount of the change in price, if any, allowance may be made for overhead and general expenses, plant rental, and other similar items.

76. CONTRACTOR QUALITY CONTROL (CQC) (4-77)

This clause applies only when specifically required by the specifications.

(a) The Contractor shall provide a quality control organization and system to perform inspections, tests, and retesting in the event of failure of all items of work, including that of his subcontractors, to assure compliance with the contract provisions. Quality control will be established for all work, except where specific provisions of the contract provide for Government approvals, inspections, and tests. The CQC system will specifically include, but not be limited to, the inspections and tests required in the technical provisions of the contract specifications and shall cover all construction operations, including both on-site and off-site fabrication.

(b) The Contractor shall provide a CQC representative, supplemented as necessary by additional personnel, who shall be on the work at all times during progress, with complete authority to take any action necessary to ensure compliance with the contract. The CQC representative shall be appointed by a letter addressed to him and signed by an officer of the firm. This letter shall detail the CQC representative's authority and responsibility to act for the Contractor. The CQC representative shall report directly to an officer of the firm, and shall not be the same individual as, nor be subordinate to, the job superintendent or project manager. The CQC representative shall have no job-related responsibilities other than quality control.

(c) The Contractor shall furnish four copies of the CQC plan to the Contracting Officer within fifteen calendar days after receipt of the Notice of Award. The CQC plan shall detail the procedures, instructions, and reports to be used to assure compliance with the contract. Unless specifically authorized by the Contracting Officer in writing, no construction will be started until the CQC plan is approved. This plan will include, as a minimum:

(1) A copy of the letter appointing the CQC representative, signed by an officer of the firm, outlining the CQC representative's duties, responsibilities, and authority. This letter must include the authority to direct removal and replacement of any defective work.

(2) The quality control organization in chart form, showing the relationship of the quality control organization to other elements of the firm.

(3) Names and qualifications of personnel in the quality control organization.

(4) Area of responsibility and authority of each individual in the quality control organization.

(5) A listing of outside organizations such as testing laboratories, architects, and consulting engineers that will be employed by the Contractor, and a description of the services these firms will provide.

(6) Procedures for reviewing all shop drawings, samples, certificates, or other submittals for contract compliance, including the name of the person(s) authorized to sign the submittals for the Contractor, as complying with the contract.

(7) An inspection schedule, keyed to the construction schedule and following the order of the specification technical sections, indicating what inspections and tests, the names of persons responsible for the inspection and testing for each segment of work, and the time schedule for each inspection and test.

(8) The procedures for documenting quality control operation, inspection, and testing, with a copy of all forms and reports to be used for this purpose. The Contractor shall also include a submittal status log listing all submittals required by the specifications and stating the action required by Contractor or the Government. The Contractor shall complete columns (a) through (e) of this log and name the persons authorized to review the submittals.

(d) Inspection procedures shall include, as a minimum:

(1) Preparatory Inspection. Preparatory Inspection shall be performed before beginning any work, and in addition, before beginning each segment of work. Preparatory Inspection shall include a review of the contract requirements, the review and approval of shop drawings and other submittal data, a check to assure that required control testing will be provided, a physical examination to assure that all materials and equipment conform to approved shop drawings and submittal data, and a check to assure that all required preliminary work has been completed.

(2) Initial Inspection. An Initial Inspection shall be performed as soon as a representative segment of the particular item of work has been accomplished. Initial inspection shall include performance of scheduled tests, examination of the quality of workmanship, a review of test results for compliance with contract requirements, a review for omissions or dimensional errors, and approval or rejection of the initial segment of the work.

(3) Follow-up Inspections. Follow-up Inspections shall be performed daily, and more frequently as necessary, and shall include continued testing and examinations to assure continued compliance with the contract requirements.

(e) At least five days after the CQC Plan is submitted, but before construction operations are started, the Contractor shall meet with the Contracting Officer and discuss the quality control requirements. The purpose of the meeting shall be to develop a mutual understanding relative to details of the system, including forms to be used for recording the quality control operations, inspections, tests, approvals, certifications, administration of the system, and Government surveillance. This meeting shall also develop a schedule for future weekly or biweekly CQC meetings and shall establish procedures for submission of daily reports and other records and documents.

(f) The Contractor shall submit daily CQC reports to the Contracting Officer identifying prime and subcontractor personnel and equipment on the site, idle equipment and personnel, material deliveries, weather conditions, work accomplished, inspections and tests conducted, results of inspection and tests, nature of defects found, causes for rejection, proposed remedial action, and corrective actions taken, together with the following certification: "On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above." This certification shall be signed for the Contractor by the authorized CQC representative.

(g) Test results provided shall cite the contract requirements, the test or analysis procedures used, and the actual test results, and include a statement that the item tested or analyzed conforms or fails to conform to the specification requirements. Each report shall be conspicuously stamped on the cover sheet in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements as the case may be. All test reports shall be signed by a testing laboratory representative authorized to sign certified test reports. The Contractor shall arrange for immediate and direct delivery of the signed original of all reports, certifications, and other documentation to the Contracting Officer.

(h) All submittals, shop drawings, catalog cuts, samples, etc., unless otherwise specifically noted, shall be approved and certified by the Contractor as conforming to the drawings and specifications. Four copies of all shop drawings, catalog cuts, or other submittals, with the Contractor's approval indicated thereon, shall be sent to the Contracting Officer within one working day of the Contractor's approval.

77. DAMAGES FOR DELAY - DEFENSE MATERIALS SYSTEM AND PRIORITIES (6-72)

The Government will take no action pursuant to Clause 5 of Standard Form 23A to terminate the right of the Contractor to proceed or to assess liquidated or actual damages where failure of the Contractor to complete the work within the time specified is due solely to the operation of the Defense Materials System and Priorities, provided the Contractor and his subcontractors comply with the provisions of this System and the Contractor's lateness in completion of the work is not otherwise caused by the fault or negligence of the Contractor. Such delays will be excusable within the meaning of Clause 5, and the Contractor will be entitled to a time extension by reason thereof.

78. SPECIFICATIONS AND STANDARDS (6-72)

The specifications and standards referenced in this specification (including addenda, amendments, and errata listed) shall govern in all cases where references thereto are made. In case of differences between these specifications or standards and this specification or its accompanying drawings, this specification and its accompanying drawings shall govern to the extent of such differences; otherwise, the referenced specifications and standards shall apply. The requirement for packaging, packing, marking, and preparation for shipment or delivery included in the referenced specifications shall apply only to materials and equipment that are furnished directly to the Government and not to materials and equipment that are to be furnished and installed by the Contractor.

(a) When a number in parenthesis is suffixed to a NAVFAC, NAVDOCKS, Military or Federal Specification, it denotes the effective amendment or change to the document. Amendments to Federal and Military Specifications shall be designated by placing the notation, "Amendment 1" under the basic specification designation.

(b) Unless otherwise specified by this contract specification, all tests required by the referenced specifications and standards shall be conducted at no expense to the Government under the supervision of and in a laboratory acceptable to the Government.

(c) Application for specifications other than NAVFAC, Yards and Docks, Military or Federal specifications should be made to the organizations publishing them. NAVFAC, Yards and Docks, Federal, and Military specifications may be ordered from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120. However, a copy of all referenced documents will be available for examination only at the office of the Officer in Charge of Construction.

79. SECURITY REQUIREMENTS (6-72)

No employee or representative of the Contractor will be admitted to the site of the work unless he furnishes satisfactory proof that he is a citizen of the United States or, is specifically authorized admittance to the site of the work by the OICC.

80. STATION REGULATIONS (6-72)

The Contractor and his employees and subcontractors shall become familiar with and obey all Station regulations including fire, traffic, and security regulations. All personnel employed on the station shall keep within the limits of the work (and avenues of ingress and egress), and shall not enter any restricted areas unless required to do so and are cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

81. ORDER OF WORK (8-75)

The Contractor shall schedule his work as to cause the least amount of interference with Station operations. Work schedules shall be subject to the approval of the Officer in Charge of Construction. Permission to connect or interrupt any Station Roads, Railroads and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

82. SCHEDULE OF PRICES (6-72)

Within 5 days of receipt of a Notice of Award, the Contractor shall prepare and submit to the Officer in Charge of Construction, a Schedule of Prices (Construction Contract), NAVFAC 4330/4. The schedule shall consist of a detailed breakdown of the contract price, giving the quantities for each of the various kinds of work, the unit prices, and the total prices therefor. The detailed breakdown shall be segregated under each of the construction categories given hereinafter. The required schedule must be based on the actual breakdown of the bid price. Accordingly, subcontractors who may be involved in work under more than one of these categories shall be advised of this requirement in order to assure their being in a position to furnish these data without delay. The format, content, and number of copies required shall be as further prescribed by the Officer in Charge of Construction and shall be subject to his approval. The submission of the required data shall not otherwise affect the contract terms. Form NAVFAC 4330/4 will be furnished by the Officer in Charge of Construction.

83. CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT (6-72)

Requests for payment in accordance with the terms of the contract shall consist of:

(a) Contractor's Invoice on form NAVFAC 10-7300/30, which shall show, in summary form, the basis for arriving at the amount of the invoice, and

(b) Contract Performance Statement on form NAVFAC 10-7300/31, which shall show in detail, the estimated cost percentage of completion and value of completed performance for each of the construction categories given hereinafter. The format, content, and number of copies required shall be as further prescribed by the Officer in Charge of Construction and shall be subject to his

approval. The submission of the required data shall not otherwise affect the contract terms. Forms NAVFAC 10-7300/30 and 10-7300/31 will be furnished by the Officer in Charge of Construction.

84. AS-BUILT RECORD OF MATERIALS USED IN BUILDINGS (6-72)

Prior to completion of the contract, the Contractor shall furnish an "as-built" record of materials used in the construction. Submittal of this data is made a condition for final payment under the contract. Where several manufacturer's brands, types, or classes of the item listed have been used in the project, the specific areas where each item was used shall be designated. Designations shall be keyed to the area and space designations on the contract drawings.

85. OPTIONAL REQUIREMENTS (6-72)

Where a choice of materials and/or methods is permitted herein, the Contractor will be given the right to exercise the option unless stated specifically otherwise.

86. PROPOSED MATERIAL SUBMITTALS REQUIRED OF THE CONTRACTOR (6-72)

Proposed material submittals required of the Contractor shall be made allowing sufficient time for processing, reviews, approval, and procurement before the Contractor is ready to use the material. No material shall be used prior to written approval. Submittals shall be prepared and assembled as follows:

(a) Submit seven copies of each submittal.

(b) Present all submittals for each specification section as a complete bound volume, titled with project title and contract number.

(c) Provide index of included items with each volume. Title the index with applicable specification section name and number.

(d) Clearly mark each item in volume with specification paragraph number to which it pertains.

(e) Assemble each volume in same numerical sequence as specifications section paragraphs.

(f) See individual technical sections for additional information.

The Contractor shall certify on all submittals that the material being proposed conforms to contract requirements. In the event of any variance, the Contractor shall state specifically which portions vary, and request approval of a substitute. The Contractor shall also certify that all Contractor-furnished equipment can be installed in the allocated spaces. Incomplete submittals and submittals with inadequate data will be rejected.

87. CATALOG DATA (6-72)

Catalog data shall be printed pages on permanent copies of the manufacturer's catalogs.

88. SAMPLES (6-72)

Samples in the number specified, shall be shipped prepaid, and delivered as directed by the Officer in Charge of Construction. Samples shall be marked to show name of material, name of supplier, contract number, segment of work where material represented by sample is to be used, and name of Contractor submitting sample.

89. STORM PROTECTION (6-72)

Should warnings of winds of gale force or stronger be issued, the Contractor shall take every practicable precaution to minimize danger to person, to the work and to adjacent property.

90. CONTRACTOR'S DAILY REPORT (6-72)

The Contractor will be required to submit a "Daily Report to Inspector," Form NAVFAC 4330/34. The forms shall be completed daily and delivered to the Officer in Charge of Construction. Data to be included in the form is data on workers by classification, the move-on and move-off of construction equipment furnished by the prime and subcontractor or furnished by the Government, and materials and equipment delivered to the site of installation in the work.

If Clause 76, "Contractor Quality Control" is applicable to this contract, the information required by this clause shall be submitted as part of the reports required under Clause 76.

91. WORK OUTSIDE REGULAR HOURS (6-72)

If the Contractor desires to carry on work outside regular hours or on Saturdays, Sundays, or holidays, he shall submit application to the Officer in Charge of Construction, but shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, he shall light the different parts of the work in an approved manner. All utility cutovers shall be made after normal working hours or on weekends. Anticipated costs shall be included in the bid.

92. EXISTING WORK (6-72)

The disassembling, disconnecting, cutting, removal or altering in any way of existing work shall be carried on in such a manner as to prevent injury or damage to all portions of existing work, whether they are to remain in place,

be re-used in the new work, or be salvaged and stored. All portions of existing work which have been cut, damaged or altered in any way during construction operations shall be repaired or replaced in kind and in an approved manner to match existing or adjoining work. All work of this nature shall be performed by the Contractor at his expense and shall be as directed. Existing work shall, at the completion of all operations, be left in a condition as good as existed before the new work started.

93. SUBCONTRACTING PLAN FOR SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS CONCERNS (FORMALLY ADVERTISED) (1980 AUG)

(a) This provision does not apply to small business concerns.

(b) The apparent low bidder, upon request by the Contracting Officer, shall submit a subcontracting plan which addresses separately subcontracting with small business concerns and small disadvantaged business concerns, and which shall be included in and made a material part of the resultant contract. The subcontracting plan shall be submitted within the time specified by the Contracting Officer. Failure to submit the subcontracting plan shall make the bidder ineligible for the award of a contract. As a minimum, the subcontracting plan shall include:

(1) Separate percentage goals (expressed in terms of percentage of total planned subcontracting dollars) for the utilization as subcontractors of small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals; for the purposes of the subcontracting plan, the Contractor shall include all subcontracts to be awarded for the specific purpose of performing this contract and may include a proportionate share of supplies and services whose costs are normally allocated as indirect or overhead costs when reasonably determined to be attributable to this contract.

a. A statement of: (i) total dollars planned to be subcontracted; (ii) total dollars planned to be subcontracted to small business: and (iii) total dollars planned to be subcontracted to small disadvantaged business.

b. A description of the principal supply and service areas to be subcontracted and an identification of those areas where it is planned to use (i) small business subcontractors, and (ii) small disadvantaged business subcontractors.

c. A statement of the method used in developing proposed subcontracting goals for small business and small disadvantaged business concerns.

d. If the offeror includes indirect and overhead costs as an element in establishing the goals in the subcontracting plan, the method used in determining the proportionate share of indirect and overhead costs incurred with (i) small business, and (ii) small disadvantaged business subcontractors shall be explained.

e. A statement of the method used for solicitation purposes (e.g., did the offeror use company source lists, the small business and disadvantaged small business source identification system provided by the Small Business Administration's Procurement Automated Source System, the National Minority Purchasing Council Vendor Information Service, or the services provided by the U.S. Department of Commerce Minority Business Development Agency's Research and Information Division, and the facilities of small business and disadvantaged business trade associations?).

(2) The name of an individual within the employ of the bidder who will administer the subcontracting plan of the bidder and a description of the duties of such individual;

(3) A description of the efforts the bidder will make to assure that small business and small disadvantaged business concerns will have an equitable opportunity to compete for subcontracts;

(4) Assurances that the bidder will include the clause entitled Utilization of Small Business and Small Disadvantaged Business Concerns in all subcontracts which offer further subcontracting possibilities in the United States, and that the bidder will require all subcontractors (except small business concerns) who receive subcontracts in excess of $1 million in the case of a contract for the construction of any public facility, or in excess of $500,000 in the case of all other contracts, to adopt a plan in consonance with this clause;

(5) Assurances that the bidder will submit such periodic reports and cooperate in any studies or surveys as may be required by the contracting agency or the Small Business Administration in order to determine the extent of compliance by the bidder with the subcontracting plan; and

(6) A recitation of the types of records the successful bidder will maintain to demonstrate procedures which have been adopted to comply with the requirements and goals set forth in the plan, including the establishment of source lists of small business concerns and small disadvantaged business concerns; and efforts to identify and award subcontracts to such small business concerns. The records shall include at least the following (these records may be maintained on a plant-wide or company-wide basis unless otherwise indicated):

a. Small and disadvantaged business source lists, guides, and other data identifying small and small disadvantaged business vendors.

b. Organizations contacted for small and disadvantaged business sources.

c. On a contract-by-contract basis, records on all subcontract solicitations over $100,000, indicating on each solicitation (i) whether small business was solicited and if not, why not; (ii) whether small disadvantaged business was solicited and if not, why not; and (iii) reasons for the failure of responding small businesses or small disadvantaged businesses to receive the subcontract award.

d. Records to support such efforts as:

(i) contacts with disadvantaged and small business trade associations;

(ii) contacts with business development organizations; and

(iii) attendance at small and disadvantaged business procurement conferences and trade fairs.

e. Records to support internal activities to guide and encourage buyers such as:

(i) workshops, seminars, training programs,etc., and

(ii) monitoring activities to evaluate compliance.

f. On a contract-by-contract basis, records to support award data submitted to the Government to include name, address, and size status of subcontractor.

(c) In order to effectively implement this plan, the Contractor shall:

(1) Issue and promulgate company-wide policy statements in support of this effort, develop written procedures and work instructions, and assign specific responsibilities regarding the requirements of this clause.

(2) Demonstrate continuing management interest and involvement in support of these programs through such actions as regular reviews of progress and establishment of overall corporate and divisional goals and objectives.

(3) Train and motivate contractor personnel in support of these programs.

(4) Assist small business and small disadvantaged business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business and disadvantaged subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(5) Provide adequate and timely consideration of the potentialities of small business and small disadvantaged business concerns in all "make-or-buy" decisions.

(6) Counsel and discuss subcontracting opportunities with representatives of small and disadvantaged business firms as are referred by the Small and Disadvantaged Business Utilization Specialist responsible for monitoring performance under this program and representatives of the SBA.

(d) The Contractor shall submit DD Form 1140-1 in accordance with instructions provided on the form.

(e) The bidder understands that:

(1) Prior compliance of the bidder with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the bidder for award of the contract.

(2) The failure of any Contractor or subcontractor to comply in good faith with (i) the clause entitled Utilization of Small Business Concerns and Small Disadvantaged Business Concerns, or (ii) the terms of any subcontracting plan required by this Small Business and Small Disadvantaged Business Subcontracting Plan (Advertised) provision, will be a material breach of the contract or subcontract.

(f) In the acquisition of commercial products, the bidder further understands that:

(1) If a commercial product (defined below) is offered, the required subcontracting plan may cover the company's production generally, both for Government contracts and for regular commercial sales, rather than just this acquisition. In such cases, the Contractor may request approval from the Contracting Officer to submit one company-wide, or division-wide, annual plan. If such request is deemed appropriate, the offeror shall submit a proposed company-wide, or division-wide, annual plan for acceptance.

(2) Upon approval by the Contracting Officer, the plan will remain in effect for the company's entire fiscal year. During this period, Government contracts for commercial products of the affected company or division will not be required to contain individual subcontracting plans relating only to the supply or services being acquired, unless the Contracting Officer determines for a particular contract that there are unforeseen possibilities for small business and small disadvantaged business subcontracting.

(3) At least 60 days before the scheduled termination of the company or division-wide plan, the Contractor may submit to the Contracting Officer a proposed company or division-wide subcontracting plan for its commercial products for the succeeding fiscal year. If the plan would otherwise terminate prior to approval of the succeeding fiscal year's plan, it will remain in effect until the succeeding plan is accepted or rejected, but no longer than 60 days after the end of the company's fiscal year.

(4) For the purpose of this program, the term "commercial product" means a product in regular production sold in substantial quantities to the general public and/or industry at established catalog or market prices. A product which, in the opinion of the Contracting Officer, differs only insignificantly from the Contractor's commercial product may be regarded for the purpose of this clause as a commercial product. (DAR 7-104.14)

94. PREFERENCE FOR DOMESTIC SPECIALTY METALS (1972 NOV)

(a) The Contractor agrees that any specialty metals (as hereinafter defined) furnished by it or purchased by it for direct incorporation in any article delivered to the Government under this contract shall have been melted in the United States, its possessions, or Puerto Rico, provided that this

clause shall have no effect to the extent that the Secretary or his designee determines, as to any such articles, that a satisfactory quality and sufficient quantity cannot be procured as and when needed at United States market prices.

(b) For the purposes of this clause, the term "specialty metals" means:

(i) steels, where the maximum alloy content exceeds one or more of the following limits: manganese, 1.65 percent; silicon, 0.60 percent; or copper 0.60 percent or which contains more than 0.25 percent of any of the following elements: aluminum, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten or vanadium;

(ii) metal alloys consisting of nickel, iron-nickel and cobalt base alloys containing a total of other alloying metals (except iron) in excess of ten percent (10%);

(iii) titanium and titanium alloys; or

(iv) zirconium and zirconium base alloys. (DAR 7-104.93(b))

95. ENVIRONMENTAL LITIGATION (12-74)

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay, or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation," as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

96. COST ACCOUNTING STANDARDS (1978 MAY)

(Applicable only if the price of this contract exceeds $100,000 and the contract is not exempt under DAR 3-1204.)

(a) Unless the Cost Accounting Standards Board has prescribed rules or regulations exempting the Contractor or this contract from standards, rules,

and regulations promulgated pursuant to 50 U.S.C. App. 2168 (Public Law 91-379, August 15, 1970), the Contractor, in connection with this contract shall:

(1) By submission of a Disclosure Statement, disclose in writing his cost accounting practices as required by regulations of the Cost Accounting Standards Board. The required disclosures must be made prior to contract award unless the Contracting Officer provides a written notice to the Contractor authorizing post-award submission in accordance with regulations of the Cost Accounting Standards Board. The practices disclosed for this contract shall be the same as the practices currently disclosed and applied on all other contracts and subcontracts being performed by the Contractor and which contain this Cost Accounting Standards clause. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement will be protected and will not be released outside the Government.

(2) Follow consistently the cost accounting practices disclosed pursuant to (1) above in accumulating and reporting contract performance cost data concerning this contract. If any change in disclosed practices is made for purposes of any contract or subcontract subject to Cost Accounting Standards Board requirements, the change must be applied prospectively to this contract, and the Disclosure Statement must be amended accordingly. If the contract price or cost allowance of this contract is affected by such changes, adjustment shall be made in accordance with subparagraph (a)(4) or (a)(5) below, as appropriate.

(4) Comply with all Cost Accounting Standards in effect on the date of award of this contract or if the Contractor has submitted cost or pricing data, on the date of final agreement on price as shown on the Contractor's signed certificate of current cost or pricing data. The Contractor shall also comply with any Cost Accounting Standard which hereafter becomes applicable to a contract or subcontract of the Contractor. Such compliance shall be required prospectively from the date of applicability to such contract or subcontract.

(4) (A) Agree to an equitable adjustment as provided in the changes clause of this contract if the contract cost is affected by a change which, pursuant to (3) above, the Contractor is required to make his established cost accounting practices whether such practices are covered by a Disclosure Statement or not.

(B) Negotiate with the Contracting Officer to determine the terms and conditions under which a change may be made to either a disclosed cost accounting practice or an established cost accounting practice, other than a change made under other provisions of this subparagraph (4): Provided, that no agreement may be made under this provision that will increase costs paid by the United States.

(C) When the parties agree to a change to either a disclosed cost accounting practice or an established cost accounting practice, other than a change under (4)(A) above, negotiate an equitable adjustment as provided in the changes clause of this contract.

(5) Agree to an adjustment of the contract price or cost allowance, as appropriate, if he or a subcontractor fails to comply with an applicable Cost Accounting Standard or to follow any practice disclosed pursuant to subparagraphs (a)(1) and (a)(2) above and such failure results in any increased cost paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States together with interest thereon computed at the rate determined by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT. 97, or seven percent (7%) per annum, whichever is less, from the time the payment by the United States was made to the time the adjustment is effected.

(b) If the parties fail to agree whether the Contractor or a subcontractor has complied with an applicable Cost Accounting Standard, rule, or regulation of the Cost Accounting Standards Board and as to any cost adjustment demanded by the United States, such failure to agree shall be a dispute concerning a question of fact within the meaning of the disputes clause of this contract.

(c) The Contractor shall permit any authorized representatives of the head of the agency, of the Cost Accounting Standards Board, or of the Comptroller General of the United States to examine and make copies of any documents, papers, or records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts which he enters into the substance of this clause except paragraph (b), and shall require such inclusion in all other subcontracts of any tier, including the obligation to comply with all Cost Accounting Standards in effect on the date of award of the subcontract or if the subcontractor has submitted cost or pricing data, on the date of final agreement on price as shown on the subcontractor's signed certificate of current cost or pricing data. This requirement shall apply only to negotiated subcontracts in excess of $100,000 where the price negotiated is not based on:

(i) established catalog or market prices of commercial items sold in substantial quantities to the general public, or

(ii) prices set by law or regulation and except that the requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to accept the Cost Accounting Standards clause by reason of Section 331.30(b) of Title 4 Code of Federal Regulations (4 CFR 331.30(b)).

Note: (1) Subcontractors shall be required to submit their Disclosure Statements to the Contractor. However, if a subcontractor has previously submitted his Disclosure Statement to a Government Administrative Contracting Officer (ACO) he may satisfy that requirement by certifying to the Contractor the date of such Statement and the address of the ACO.

Note: (2) In any case where a subcontractor determines that the Disclosure Statement information is privileged and confidential and declines to provide it to his Contractor or higher tier subcontractor the Contractor may authorize direct submission of that subcontractor's Disclosure Statement to the same Government offices to which the Contractor was required to make submission of his Disclosure Statement. Such authorization shall in no way

relieve the Contractor of liability as provided in paragraph (a)(5) of this clause. In view of the foregoing and since the contract may be subject to adjustment under this clause by reason of any failure to comply with rules, regulations, and Standards of the Cost Accounting Standards Board in connection with covered subcontracts, it is expected that the Contractor may wish to include a clause in each such subcontract requiring the subcontractor to appropriately indemnify the Contractor. However, the inclusion of such a clause and the terms thereof are matters for negotiation and agreement between the Contractor and the subcontractor, provided that they do not conflict with the duties of the Contractor under its contract with the Government. It is also expected that any subcontractor subject to such indemnification will generally require substantially similar indemnification to be submitted by his subcontractors.

Note: (3) If the subcontractor is a business unit which, pursuant to 4 CFR 332 is entitled to elect modified contract coverage and to follow Standards 401 and 402 only, the clause entitled "Disclosure and Consistency of Cost Accounting Practices" set forth in DAR 7-104.83(a)(2) shall be inserted in lieu of this clause.

(e) The terms defined in Section 331.20 of Part 331 of Title 4, Code of Federal Regulations (4 CFR 331.20) shall have the same meanings herein. As there defined, "negotiated subcontract" means "any subcontract except a firm fixed-price subcontract made by a Contractor or subcontractor after receiving offers from at least two firms not associated with each other or such Contractor or subcontractor, providing (1) the solicitation to all competing firms is identical, (2) price is the only consideration in selecting the subcontractor from among the competing firms solicited, and (3) the lowest offer received in compliance with the solicitation from among those solicited is accepted." (DAR 7-104.83)

97. AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (1978 SEP)

(a) As used in this clause:

(1) "Covered area" means the geographical area described in the solicitation from which this contract resulted:

(2) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

(3) "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

(4) "Minority" includes:

(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race):

(iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(b) Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of this clause and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitation from which this contract resulted.

(c) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

(d) The Contractor shall implement the specific affirmative action standards provided in paragraph (g)(1) through (16) of this clause. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

(e) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, or the regulations promulgated pursuant thereto.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period. and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

(1) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

(2) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

(4) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under (g)(2) above.

(6) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

(7) Review, at least annually, the company's EEO policy and affirmative action obligations under this clause with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.

(9) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

(11) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

(13) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under this clause are being carried out.

(14) Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

(15) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

(h) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations ((g)(1) through (16)). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under (g)(1) through (16) of this clause provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

(j) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of this clause and Executive Order 11246, as amended.

(m) The Contractor, in fulfilling its obligations under this clause, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or this clause, the Director shall proceed in accordance with 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

(o) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

52. AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (1976 MAY)

(a) The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(b) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(c) In the event of the Contractor's noncompliance with the requirements of this clause, action for noncompliance may be taken in accordance with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.

(d) The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the Contracting Officer. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.

(e) The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.

(f) The Contractor will include the provisions of this clause in every subcontract or purchase order of $2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance. (DAR 7-103.28)

99. CLEAN AIR AND WATER (1975 OCT)

(Applicable only if the contract exceeds $100,000 or the Contracting Officer has determined that orders under an indefinite quantity contract in any one year will exceed $100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8c(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or the contract is not otherwise exempt.)

(a) The Contractor agrees as follows:

(i) to comply with all the requirements of section 114 of the Clean Air Act, as amended (42 U.S.C. 1857, et seq., as amended by Public Law 91-604) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251, as amended by Public Law 92-500), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, respectively, and all regulations and guidelines issued thereunder before the award of this contract;

(ii) that no portion of the work required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date this contract was awarded unless and until the EPA eliminates the name of such facility or facilities from such listing;

(iii) to use his best efforts to comply with clean air standards and clean water standards at the facilities in which the contract is being performed; and

(iv) to insert the substance of the provisions of this clause in any nonexempt subcontract, including this paragraph (iv).

(b) The terms used in this clause have the following meanings.

(1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Public Law 91-604).

(2) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Public Law 92-500).

(3) The term "clean air standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110(d) of the Clean Air Act (42 U.S.C. 1857c-5(d)), an approved implementation procedure or plan under section 111(c) or section 111(d), respectively, of the Air Act (42 U.S.C. 1857c-6(c) or (d)), or an approved implementation procedure under section 112(d) of the Air Act (42 U.S.C. 1857c-7(d)).

(4) The term "clean water standards" means any enforceable limitation, control, condition, prohibition, standard or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. 1342), or by a local government to ensure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. 1317).

(5) The term "compliance" means compliance with clean air or water standards. Compliance shall also mean compliance with a schedule or plan ordered or approved by a court of competent jurisdiction, the Environmental Protection Agency or an air or water pollution control agency in accordance with the requirement of the Air Act or Water Act and regulations issued pursuant thereto.

(6) The term "facility" means any building, plant, installation, structure, mine, vessel or other floating craft, location, or site of operations, owned, leased, or supervised by a Contractor, subcontractor, to be utilized in the performance of a contract or subcontract. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location or site shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are colocated in one geographical area.

(7) The term "nonexempt contract or subcontract" means a contract or subcontract of more than $100,000 which is not otherwise exempted pursuant to the EPA regulations implementing the Air Act and Water Act (40 CFR 15.5), as further implemented in DAR 1-2302.4 or in FPR 1-1.2302-4 (whichever is applicable) and the procedures of the Department awarding the contract. (DAR 7-103.29)

100. EQUITABLE ADJUSTMENTS: WAIVER AND RELEASE OF CLAIMS (7-76)

(a) Whenever the Contractor submits a claim for equitable adjustment under any clause of this contract which provides for equitable adjustment of the contract, such claim shall include all types of adjustments in the total amounts to which the clause entitles the Contractor, including but not limited to adjustments arising out of delays or disruptions or both caused by such change. Except as the parties may otherwise expressly agree, the Contractor shall be deemed to have waived (i) any adjustments to which it otherwise might be entitled under the clause where such claim fails to request such adjustments, and (ii) any increase in the amount of equitable adjustments additional to those requested in its claim.

(b) Further, the Contractor agrees that, if required by the Contracting Officer, he will execute a release, in form and substance satisfactory to the Contracting Officer, as part of the supplemental agreement setting forth the aforesaid equitable adjustment, and that such release shall discharge the Government, its officers, agents and employees, from any further claims, including but not limited to further claims arising out of delays or disruptions or both, caused by the aforesaid change.

101. AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (1976 JUL)

(This clause is applicable pursuant to 41 C.F.R. 60-250, if this contract is for $10,000 or more.)

(a) The Contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment or otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability or veterans status in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(b) The Contractor agrees that all suitable employment openings of the Contractor which exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract and including those occurring at an establishment of the Contractor other than the one wherein the contract is being performed but excluding those of independently operated corporate affiliates, shall be listed at an appropriate local office of the State employment service system wherein the opening occurs. The Contractor further agrees to provide such reports to such local office regarding employment openings and hires as may be required.

State and local government agencies holding Federal contracts of $10,000 or more shall also list all their suitable openings with the appropriate office of the State employment service, but are not required to provide those reports set forth in paragraphs (d) and (e).

(c) Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and nonveterans. The listing of employment openings does not require the hiring of any particular job applicant or from any particular group of job applicants, and nothing herein is intended to relieve the Contractor from any requirements in Executive Orders or regulations regarding nondiscrimination in employment.

(d) The reports required by paragraph (b) of this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office or, where the Contractor has more than one hiring location in a State, with the central office of that State employment

service. Such reports shall indicate for each hiring location (1) the number of individuals hired during the reporting period, (2) the number of nondisabled veterans of the Vietnam era hired, (3) the number of disabled veterans of the Vietnam era hired, and (4) the total number of disabled veterans hired. The reports shall include covered veterans hired for on-the-job training under 38 USC 1787. The Contractor shall submit a report within 30 days after the end of each reporting period wherein any performance is made on this contract identifying data for each hiring location. The Contractor shall maintain at each hiring location copies of the reports submitted until the expiration of one year after final payment under the contract, during which time these reports and related documentation shall be made available, upon request, for examination by any authorized representatives of the Contracting Officer or of the Secretary of Labor. Documentation would include personnel records respecting job openings, recruitment and placement.

(e) Whenever the Contractor becomes contractually bound to the listing provisions of this clause, it shall advise the employment service system in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these provisions and has so advised the State system, there is no need to advise the State system of subsequent contracts. The Contractor may advise the State system when it is no longer bound by this contract clause.

(f) This clause does not apply to the listing of employment openings which occur and are filled outside of the 50 States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands.

(g) The provisions of paragraphs (b), (c), (d) and (e) of this clause do not apply to openings which the Contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement. This exclusion does not apply to a particular opening once an employer decides to consider applicants outside of his own organization or employer-union arrangement for that opening.

(h) As used in this clause:

(1) "All suitable employment openings" includes, but is not limited to, openings which occur in the following job categories: production and nonproduction; plant and office; laborers and mechanics; supervisory and nonsupervisory; technical; and executive, administrative, and professional openings as are compensated on a salary basis of less than $25,000 per year. This term includes full-time employment, temporary employment of more than 3 days' duration, and part-time employment. It does not include openings which the Contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement nor openings in an educational institution which are restricted to students of that institution. Under the most compelling circumstances an employment opening may not be suitable for listing, including such situations where the needs of the Government cannot reasonably be otherwise supplied, where listing would be contrary to national security, or where the requirement of listing would otherwise not be for the best interest of the Government.

(2) "Appropriate office of the State employment service system" means the local office of the Federal-State national system of public employment offices with assigned responsibility for serving the area where the employment opening is to be filled, including the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.

(3) "Openings which the Contractor proposes to fill from within his own organization" means employment openings for which no consideration will be given to persons outside the Contractor's organization (including any affiliates, subsidiaries, and the parent companies) and includes any openings which the Contractor proposes to fill from regularly established "recall" lists.

(4) "Openings which the Contractor proposes to fill pursuant to a customary and traditional employer-union hiring arrangement" means employment openings which the Contractor proposes to fill from union halls, which is part of the customary and traditional hiring relationship which exists between the Contractor and representatives of his employees.

(i) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Vietnam Veterans Readjustment Act, hereinafter referred to as the "Act" (38 U.S.C. 2012).

(j) In the event of the Contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(k) The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, Office of Federal Contract Compliance Programs, provided by or through the Contracting Officer. Such notice shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era for employment, and the rights of applicants and employees.

(l) The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of the Vietnam Era Veterans Readjustment Assistance Act, and is committed to take affirmative action to employ and advance in employment qualified disabled veterans and, veterans of the Vietnam Era.

(m) The Contractor will include the provisions of this clause in every subcontract or purchase order of $10,000 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance. (DAR 7-103.27)

102. ADMINSTRATION OF COST ACCOUNTING STANDARDS (1978 MAY)

For the purpose of administering Cost Accounting Standards requirements under this contract, the Contractor shall:

(a) Submit to the cognizant Contracting Officer a description of the accounting change and the general dollar magnitude of the change to reflect the sum of all increases and the sum of all decreases for all contracts containing the Cost Accounting Standards clause (DAR 7-104.83(a)(1)) or the Disclosure and Consistency of Cost Accounting Practices clause (DAR 7-104.83(a)(2)):

(i) for any change in cost accounting practices required to comply with a new cost accounting standard in accordance with paragraph (a)(3) and (a)(4)(A) of the clause entitled "Cost Accounting Standards" within sixty (60) days (or such other date as may be mutually agreed to) after award of a contract requiring such change;

(ii) for any change to cost accounting practices proposed in accordance with paragraph (a)(4)(B) or (a)(4)(C) of the clause entitled "Cost Accounting Standards" or with paragraph (a)(3) or (a)(5) of the clause entitled "Disclosure and Consistency of Cost Accounting Practices" not less than sixty (60) days (or such other date as may be mutually agreed to) prior to the effective date of the proposed change; or

(iii) for any failure to comply with an applicable Cost Accounting Standard or to follow a disclosed practice as contemplated by paragraph (a)(5) of the clause entitled "Cost Accounting Standards" or with paragraph (a)(4) of the clause entitled "Disclosure and Consistency of Cost Accounting Practices" within sixty (60) days (or such other date as may be mutually agreed to) after the date of agreement of such noncompliance by the Contractor.

(b) Submit a cost impact proposal in the form and manner specified by the cognizant Contracting Officer within sixty (60) days (or such other date as may be mutually agreed to) after the date of determination of the adequacy and compliance of a change submitted pursuant to (a)(i), (ii), or (iii) above.

(c) Agree to appropriate contract and subcontract amendments to reflect adjustments established in accordance with paragraphs (a)(4) and (a)(5) of the clause entitled "Cost Accounting Standards" or with paragraphs (a)(3), (a)(4), and (a)(5) of the clause entitled "Disclosure and Consistency of Cost Accounting Practices."

(d) When the subcontract is subject to either the clause entitled "Cost Accounting Standards" or the clause entitled "Disclosure and Consistency of Cost Accounting Practices" so state in the body of the subcontract and/or in the letter of award. Self-deleting clauses shall not be used.

(e) Include the substance of this clause in all negotiated subcontracts containing either the clause entitled "Cost Accounting Standards" or the clause entitled "Disclosure and Consistency of Cost Accounting Practices." In addition within thirty (30) days after award of such subcontract submit the

following information to the Contractor's cognizant Contract Administration Office for transmittal to the Contract Administration Office cognizant of the subcontractor's facility.

(1) Subcontractor's name and subcontract number.

(2) Dollar amount and date of award.

(3) Name of Contractor making the award.

(4) A statement as to whether the subcontractor has made or proposes to make any changes to accounting practices that affect prime contracts or subcontracts containing the Cost Accounting Standards clause or Disclosure and Consistency of Cost Accounting Practices clause because of the award of this subcontract unless such changes have already been reported. If award of the subcontract results in making a Cost Accounting Standard(s) effective for the first time, this shall also be reported.

(f) For negotiated subcontracts containing the clause entitled "Cost Accounting Standards," require the subcontractor to comply with all standards in effect on the date of final agreement on price as shown on the subcontractor's signed certificate of current cost or pricing data or date of award whichever is earlier.

(g) In the event an adjustment is required to be made to any subcontract hereunder, notify the Contracting Officer in writing of such adjustment and agree to an adjustment in the price or estimated cost and fee of this contract, as appropriate, based upon the adjustment established under the subcontract. Such notice shall be given within thirty (30) days after receipt of the proposed subcontract adjustment, or such other date as may be mutually agreed to, and shall include a proposal for adjustment to such higher tier subcontract or prime contract as appropriate.

(h) When either the Cost Accounting Standards clause or the Disclosure and Consistency of Cost Accounting Practices clause and this clause are included in subcontracts, the term "Contracting Officer" shall be suitably altered to identify the purchaser.

103. GEOGRAPHIC DISTRIBUTION OF DEFENSE SUBCONTRACT DOLLARS (1978 SEP)

(This clause shall be applicable to any contract to be awarded which is expected to exceed $500,000 or when any modification increases the aggregate amount of a contract to $500,000 or more.)

(a) For each subcontract or modification thereof exceeding $10,000 the Contractor agrees to prepare and submit the report on DoD subcontracts in accordance with DD Form 2139.

(b) Negative reports will be submitted annually to the addressee contained in DD Form 2139, when applicable. Negative reports will be submitted not later than October 31 for the 12-month period ending September 30 of each year. Negative reporting will be continued until the contract or subcontract has been completed and the addressee contained in DD Form 2139 notified of its completion.

(c) The Contractor further agrees to insert the provisions of paragraphs (a) and (b) above in each subcontract in excess of $100,000 except subcontracts for ores, natural gas, utilities, petroleum products and crudes, timber (logs) and subsistence. (DAR 7-104.78)

104. EMPLOYMENT OF OCEAN-GOING VESSELS BY CONSTRUCTION CONTRACTORS (1979 JUN)

(a) If ocean transportation is required after the date of award of this contract to bring any supplies, materials, or equipment, to the construction site from the United States either for use in performance of or for incorporation in the work called for by this contract, United States-flag vessels shall be employed in such transportation to the extent such vessels are available at fair and reasonable rates for United States-flag vessels. The Contractor shall not make any shipment exceeding ten measurement tons (400 cubic feet) by other than a United States-flag vessel without notifying the Contracting Officer that United States-flag vessels are not available at fair and reasonable rates for such vessels and obtaining his permission to ship in other vessels. If such permission is granted, the contract price shall be equitably adjusted to reflect the difference in cost.

(b) The Contractor shall include the substance of this clause, including this paragraph (b), in each subcontract or purchase order hereunder which may involve the ocean transportation of construction supplies, materials, or equipment from the United States.

(c) Promptly after each shipment the Contractor shall furnish to the U.S. Maritimes Administration, Division of National Cargo, 14th and E Streets, N.W., Washington, D.C. 20230, one copy of the applicable ocean shipping document indicating for each shipment made under this contract the name and nationality of the vessel and the measurement tonnage (400 cubic feet) shipped on such vessel. (DAR 7-603.41)

105. CERTIFICATION OF REQUESTS FOR ADJUSTMENT OR RELIEF EXCEEDING $100,000 (1980 FEB)

(a) Any contract claim, request for equitable adjustment to contract terms, request for relief under Public Law 85-804, or other similar request exceeding $100,000 shall bear, at the time of submission, the following certificate given by a senior company official in charge at the plant or location involved:

> I certify that the claim is made in good faith, that the supporting data are accurate and complete to the best of my knowledge and belief; and that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable.

_____
(Official's Name)

_____
(Title)

(b) The certification in paragraph (a) requires full disclosure of all relevant facts, including cost and pricing data.

(c) The certification requirement in paragraph (a) does not apply to:

(i) requests for routine contract payments--for example, those for payment for accepted supplies and services, routine vouchers under cost reimbursement-type contracts, and progress payment invoices;

(ii) final adjustments under incentive provisions of contracts;

(d) In those situations where no claim certification for the purposes of Section 813 has been submitted prior to the inception of a contract dispute, a single certification, using the language prescribed by the Contract Disputes Act but signed by a senior company official in charge at the plant or location involved, will be deemed to comply with both statutes. (DAR 7-104.102)

106. UTILIZATION OF WOMEN-OWNED BUSINESS CONCERNS (OVER $10,000) (1980 AUG)

(a) It is the policy of the United States Government that women-owned businesses shall have the maximum practicable opportunity to participate in the performance of contracts awarded by any Federal agency.

(b) The Contractor agrees to use its best efforts to carry out this policy in the award of subcontracts to the fullest extent consistent with the efficient performance of this contract. As used in this contract, a "women-owned business" concern means a business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business and that is a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

(c) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as women-owned business concerns. (DAR 7-104.52)

Appendix B

Compiled Research Data

(1) Job No.	(2) Job Description	(3) No. of Change Orders	(4) Reason(s) for Change Orders	(5) Contract Award Price ($)	(6) Government (Owner's) Estimate ($)	(7) Next Low Bid ($)
1	addition/ alteration to academic build.	15	not known	1,295,000	1,631,444	1,410,000
2	Motorized missle magazines	36	changes to plans & specs	4,678,000	4,014,743	4,796,000
3	Energy control/ monitor system	13	lack of knowledge of existing air handling system	1,543,248	1,592,000	1,598,321
4	industrial shop area	18	Poor plans & specs	7,677,318	6,200,000	7,990,000
5	Pier with train rail	17	lack of knowledge of existing utilities	11,147,353	9,900,000	12,163,000
6	New water/sewage system	29	unforseen conditions & changes to plans & specs	6,068,770	5,200,000	6,125,000
7	Addition/ alteration to medical clinic	18	lack of knowledge of existing tie-ins & changes to plans & specs	2,029,500	1,927,778	2,065,900
8	104 bed hospital multi-story	23	changes in plans & specs	16,770,000	17,000,000	17,174,000
9	high security containment area	56	major revision & changes to plans & specs	8,414,000	9,178,000	8,471,964
10	new duct banks/ rehab office space	11	unforeseen conditions lack of knowledge of existing systems	397,235	330,000	525,252
11	3-story academic bldg.	9	poor plans & specs	743,635	679,720	787,281
12	3-story barracks	9	changes to plans & specs	3,355,570	3,691,127	3,370,000
13	academic bldg	14	changes to plans & specs	2,895,742	2,864,000	2,964,000

(1) Job No.	(2) Job Description	(3) No. of Change Orders	(4) Reason(s) for Change Orders	(5) Contract Award Price ($)	(6) Government (Owner's) Estimate ($)	(7) Next Low Bid ($)
14	2-story office bldg	10	changes to plans & specs	2,535,000	1,976,000	2,649,000
15	gas station	12	changes to plans & specs	2,964,700	2,530,250	3,106,000
16	addition/new construction office bldg	34	unforeseen conditions & changes in plans & specs	3,577,000	3,323,000	3,593,000
17	aircraft hangar	11	poor plans & specs	1,919,000	1,919,600	1,991,474
18	instal. 4 jet engine test cells	15	owner caused delay	1,833,959	1,547,000	2,104,510
19	motel	12	lack of knowledge of existing utilities	334,100	negotiated	
20	missle magazines	10	owner delay due to security poor plans & specs	874,080	894,078	898,000

(1) Job No.	(8) Job Complexity	(9) No. of Bids Received	(10) Was Prime a Local Contractor	(11) Difference Award Price (3) vs Estimate (4)		(12) Difference Award Price (3) vs Next Low Bid ($)		(13) Construction Category
				[a] actual($)	[b] %	[a] actual($)	[b] %	
1	NC	4	yes	336,444	26	115,000	9	C
2	VC	6	no	663,257	14	118,000	3	I
3	VC	4	yes	48,752	3	55,073	4	S
4	NC	4	yes	1,477,318	19	312,682	4	I
5	C	6	yes	1,247,353	11	1,015,647	9	H/I
6	NC	15	no	868,770	14	56,230	1	H/S
7	NC	7	yes	101,722	5	36,400	2	C
8	VC	21	no	230,000	1	404,000	2	C/S
9	VC	4	yes	764,000	9	57,964	1	C/S/H
10	C	4	yes	67,235	17	128,017	32	C/S
11	C	5	yes	63,915	9	43,646	6	C
12	NC	4	yes	335,557	10	14,430	0	C
13	NC	7	no	31,742	1	68,258	2	C
14	NC	2	yes	559,000	22	114,000	5	C
15	C	3	yes	434,450	15	141,300	5	C
16	C	4	no	254,000	7	16,000	1	C
17	C	8	yes	600	0	72,474	4	C
18	C	2	yes	286,959	16	270,611	15	I
19	C	-	-	-	-	-	-	S
20	VC	12	yes	19,998	2	23,920	3	C
								I

(1)	(14)		(15)		(17)		(18)
Job No.	Total Cost of All Change Orders		Cost per Change Order		Difference, Award Price vs Highest Bid		Total Number of Claims
	[a]actual($)	[b]%	[a]actual($)	[b]%	[a]actual($)	[b]%	
1	100,057	8	6,670	.53	178,333	14	4
2	687,628	15	19,100	.42	418,000	9	none
3	311,557	20	23,965	1.52	507,152	33	none
4	123,516	2	6,860	.11	396,465	5	none
5	244,832	2	14,400	.12	2,269,847	20	none
6	347,073	6	11,970	.21	1,685,230	28	3
7	48,895	2	2,715	.11	212,086	11	9
8	2,449,936	15	106,520	.65	2,636,000	16	1
9	1,287,246	15	22,985	.27	2,086,000	25	none
10	34,861	9	3,170	.82	442,765	112	none
11	47,858	6	5,320	.67	113,093	15	none
12	28,882	1	3,210	.11	664,430	20	none
13	12,538	0	895	.03	362,258	13	1
14	32,122	1	3,210	.10	114,000	5	none
15	27,203	1	2,265	.08	222,300	8	none
16	857,479	24	25,220	.71	188,000	5	3
17	34,841	2	3,170	.18	478,755	25	1
18	51,605	3	3,440	.20	270,611	15	1
19	16,949	5	1,410	.42	negotiated		1
20	46,626	5	4,665	.50	320,920	37	1

(1) Job No.	(16) Bids Received	
	[a]No.	[b]Amount($)
1	1	1,295,000
	2	1,410,000
	3	1,450,568
	4	1,473,333
2	1	4,678,000
	2	4,796,000
	3	4,830,000
	4	4,837,000
	5	4,857,000
	6	5,096,000
3	1	1,543,248
	2	1,598,321
	3	1,835,231
	4	2,050,400
4	1	7,677,318
	2	7,990,000
	3	8,359,883
	4	8,073,783
5	1	11,147,353
	2	12,163,000
	3	12,300,000
	4	12,341,795
	5	12,495,632
	6	13,417,200
6	1	6,068,770
	2	6,125,000
	3	6,323,000
	4	6,413,391
	5	6,505,000
	6	6,666,000
	7	6,987,000
	8	7,016,000
	9	7,176,000
	10	7,280,000
	11	7,450,000
	12	7,458,000
	13	7,480,000
	14	7,576,000
	15	7,754,000
7	1	2,029,500
	2	2,065,900
	3	2,159,451
	4	2,186,966
	5	2,188,328
	6	2,216,000
	7	2,241,586
8	1	16,770,000
	2	17,174,000
	3	17,368,000
8(Cont)	4	17,383,000
	5	17,352,600
	6	17,586,000
	7	17,756,000
	8	17,756,324
	9	17,800,000
	10	17,920,000
	11	18,186,000
	12	18,238,000
	13	18,323,000
	14	18,350,000
	15	18,409,000
	16	18,466,000
	17	18,470,707
	18	18,629,000
	19	19,247,700
	20	19,406,000
9	1	8,414,000
	2	8,471,964
	3	9,128,750
	4	10,500,000
10	1	397,235
	2	525,252
	3	528,200
	4	840,000

(1)	(16)	
Job No.	Bids Received	
	[a]No.	[b]Amount($)
11	1	743,635
	2	787,281
	3	797,600
	4	808,760
	5	856,728
12	1	3,355,570
	2	3,370,000
	3	3,770,000
	4	4,020,000
13	1	2,895,742
	2	2,964,000
	3	2,969,235
	4	3,069,844
	5	3,101,000
	6	3,161,895
	7	3,258,000
14	1	2,535,000
	2	2,649,000
15	1	2,964,700
	2	3,106,000
	3	3,187,000
16	1	3,577,000
	2	3,593,000
	3	3,754,000
	4	3,765,000

(1)	(16)	
Job No.	Bids Received	
	[a]No.	[b]Amount($)
17	1	1,919,000
	2	1,991,474
	3	2,000,000
	4	2,015,746
	5	2,024,900
	6	2,067,980
	7	2,083,542
	8	2,397,755
18	1	1,833,959
	2	2,104,570
19		negotiated
20	1	874,080
	2	898,000
	3	909,900
	4	910,966
	5	932,932
	6	940,000
	7	949,300
	8	974,895
	9	989,989
	10	992,672
	11	1,019,741
	12	1,195,000

(1) Job No.	(19) Total Value of All Claims ($)	(20) Reason(s) and/or Basis for Claim
1	30,936	Overinspection
2		
3		
4		
5		
6	92,000	Unfounded claim
7	150,000	Impact damages for out of sequence work
8	33,844	Impact damages due to ripple effect of change orders
9		
10		
11		
12		
13	104,078	impact damages due to owner specified work method's causing work inefficiencies
14		
15		
16	37,505	Failure to agree on change orders and difference in specs interpretation
17	11,527	Impact damages and rework as a result of improperly engineered design
18	21,103	Dispute of contract interpretation
19	289,718	Unfounded claim
20	33,514	Dispute involving interpretation of plans and specs

Description of Compiled Data

Column (1) - Job No. - This is the job number and is assigned to each project for reference.

Column (2) - Job Description - a brief narrative description of what each job entailed.

Column (3) - No. of Change Orders - the total number of change orders issued during the life of the project.

Column (4) - Reasons for Change Orders - the major reasons why the change orders listed in Column (3) were necessary.

Column (5) - Contract Award Price - the price for which the original construction contract was awarded.

Column (6) - Government (Owner's) Estimate - the project owner's estimation of the total project cost, the fair bid amount in dollars.

Column (7) - Next Low Bid - the value of the bid closest to the low bid in dollars. Note: In all cases the low bid and the contract award price are equal in value.

Column (8) - Job Complexity - the job complexity is a code assigned by the author based on the following general list of a construction project characteristics.

1. Additions to existing: structures, mechanical systems, electrical systems, etc.
2. Multi-story construction
3. Very specialized construction (eg. missle magazines)
4. Very hazardous construction
5. Special security requirements
6. Exceptional unforseen conditions

If a project was considered to have from zero to one of the above characteristics, it was rated Not Complex (NC); two to three - Complex (C); and greater than three - Very Complex (VC). Item three in the list was given double weighting in assigning complexity codes. All codes were assigned by the author in as objective a manner as possible based on his experience and knowledge of each project.

Column (9) - No. of Bids Received - the total number of bids received on each project.

Column (10) - Was Prime A Local Contractor - this column is simply an indication of whether or not the Prime contractor on each project had his home office or a permanent field office in the same local geographic area as the project job sits. If answered yes, then an office is located in the same area.

Column (11) - Difference between the Award Price and owner's estimate. (absolute value)

a) actual = $\left|\text{column (4)} - \text{column (3)}\right|$

b) percentage (%) $\left|\dfrac{\text{column (4)} - \text{column (3)}}{\text{column (3)}}\right|$

Column (12) - Difference between the Award Price and the next low bid.

a) actual = column (7) - column (5)

b) percentage (%) $\dfrac{\text{column (7)} - \text{column (5)}}{\text{column (5)}}$

Column (13) - Construction Category - the construction category is a code assigned by the author based on four basic categories of construction:

1. Heavy Construction (H)
2. Industrial Construction (I)
3. Commercial Construction (C)
4. Special Construction (S)

Each project was assigned one code best describing the type of work being done. On some of the larger jobs more than one code was assigned. The special construction category was for construction which did not fit into the first three categories. Eg. Install a jet engine test cell. These codes also were assigned as objectively as possible.

Column (14) - Total Cost of all Change Orders.

a) actual = the arithmetic sum of the dollar value of all change orders issued on each job

b) percentage (%) = $\frac{\text{column (14) a)}}{\text{column (5)}}$

Column (15) - Cost Per Change Order - the average cost of each individual change order.

a) actual = $\frac{\text{column (14) a)}}{\text{column (3)}}$

b) percentage (%) = $\frac{\text{column (14) b)}}{\text{column (3)}}$

Column (16) - Bids Received - a list of all bids received from lowest to highest dollar value by job.

a) reference number for each bid

b) the actual dollar value of each bid

Column (17) - Difference between the Contract Award Price and Highest bid received on the job.

a) actual = column (16)b)(highest) - column (5)

b) percentage (%) = $\frac{\text{column (16)b)(highest) - column (5)}}{\text{column (5)}}$

Column (18) - Total Number of Claims - the total number of all legal claims from the prime contractor against the owner.

Column (19) - Total Value of Claims - the total dollar value of all legal claims from the prime contractor against the owner.

Column (20) - Reason(s) and/or Basis For Claim - the major reasons for basing a claim against the owner.

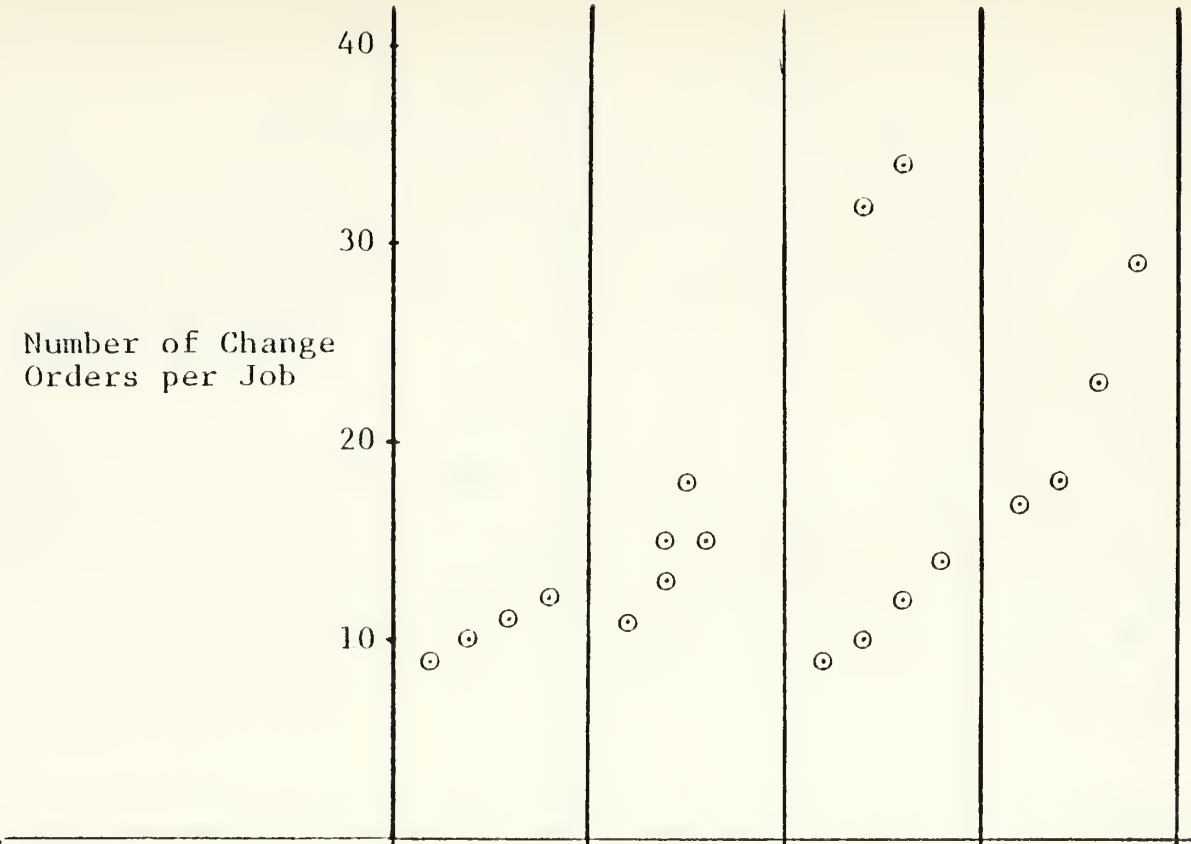
Appendix C

Graphical Presentation of Results

Classification	I	II	III	IV	All
Mean	587,263	1,724,141	3,334,335	10,015,488	4,052,661
Standard Deviation	262,627	300,066	752,688	4,198,599	4,167,109
Number of Contracts	4	5	6	5	20
Percent	20	25	30	25	100

BREAKDOWN OF CONTRACTS BY AWARD PRICE

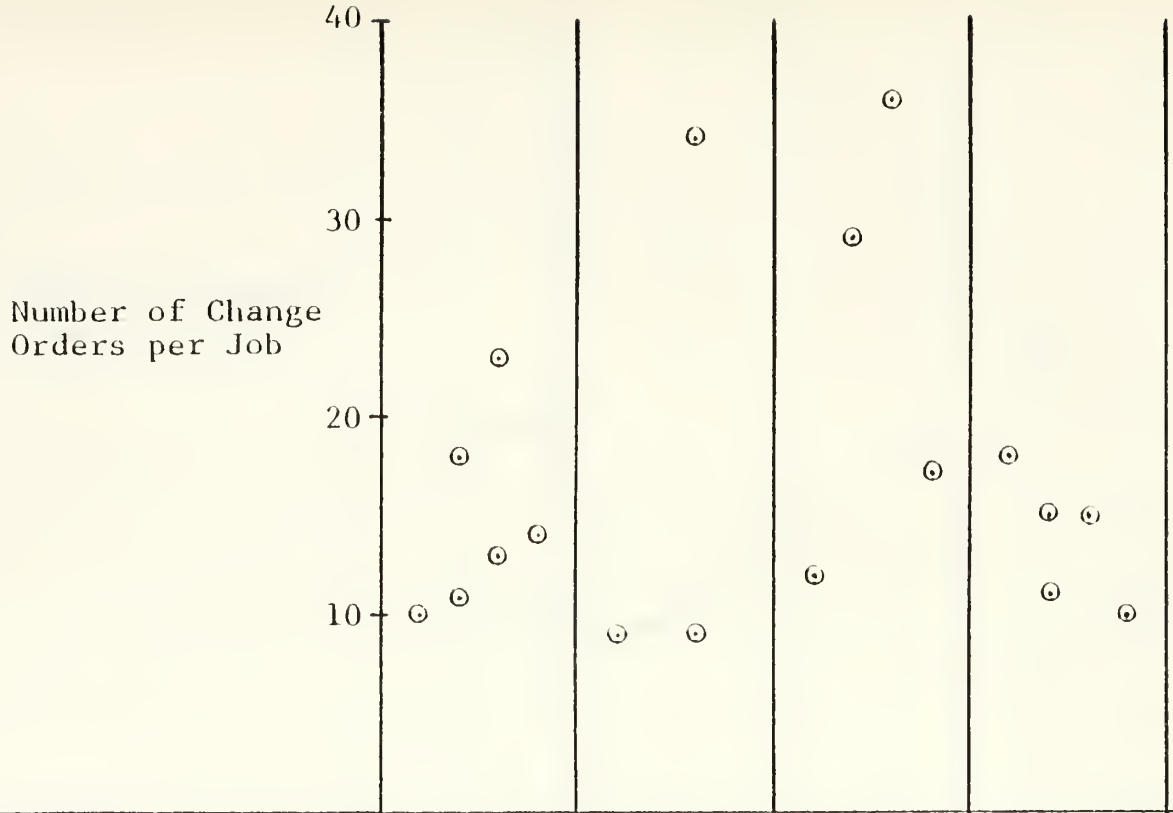
Figure C-1



Classification	I	II	III	IV	All
Avg. No. of C.O./Job	10.5	14.4	19.2	21.75	16.6
Standard Deviation	1.3	2.6	12.4	5.5	8.2
No. of Observations	4	5	6	4	19

NUMBER OF CHANGE ORDERS PER JOB VS CLASSIFICATION

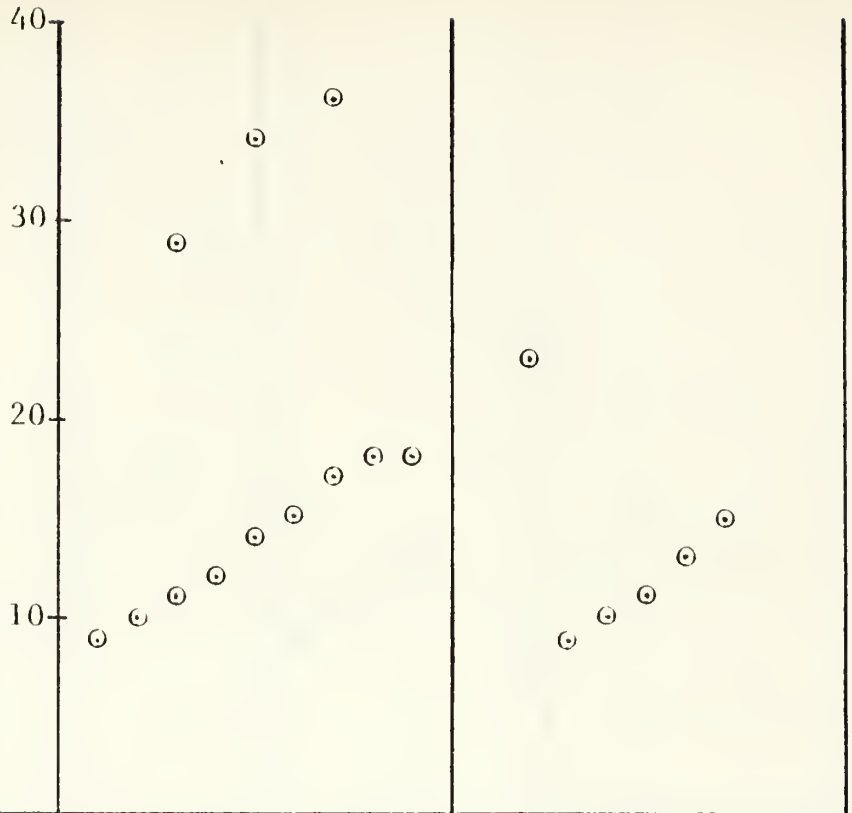
Figure C-2



Group	1	2	3	4	
% Difference Low Bid to Owner's Est.	0 - 5%	6 - 10%	11 - 15%	> 15%	All
Avg. No. C.O./Job	14.8	17.3	23.5	13.8	16.9
Standard Deviation	4.9	14.4	11.0	3.3	8.4
No. Observations	6	3	4	5	18
Range	13	25	24	8	27

NUMBER OF CHANGE ORDERS PER JOB VS ABSOLUTE VALUE OF % DIFFERENCE BETWEEN ESTIMATE & LOW BID

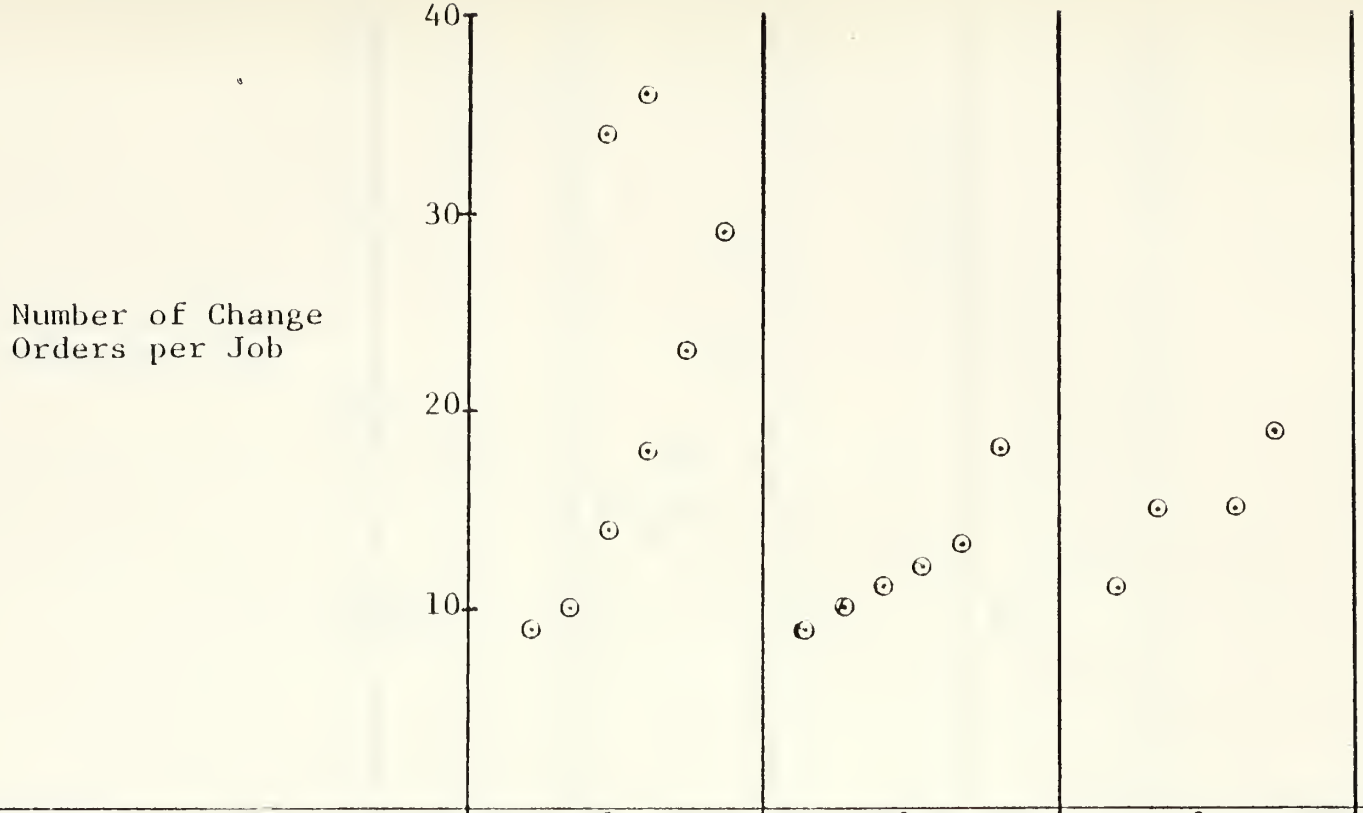
Figure C-3



Group	1	2
Above or Below Estimate	Low Bid Above Estimate	Low Bid Below Estimate
Avg. No. of C.O./Job	16.1	12.8
Standard Deviation	8.8	6.0
No. Observations	12	7
Range	25	14

NUMBER PER JOB OF CHANGE ORDERS VS WHETHER LOW BID ABOVE OR BELOW ESTIMATE

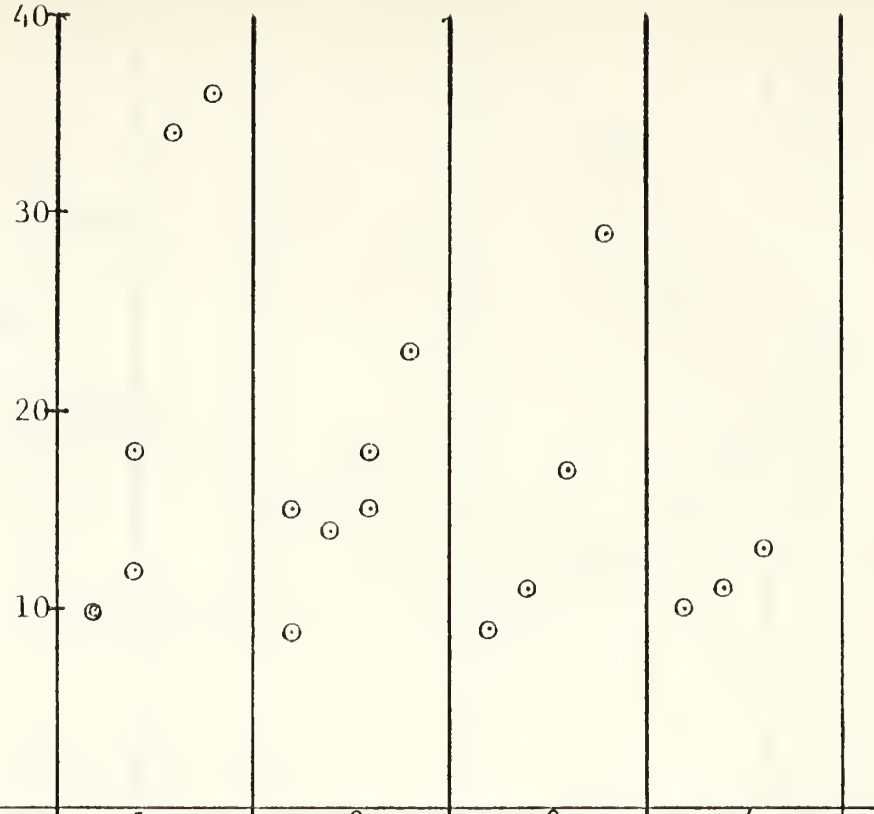
Figure C-4



Group	1	2	3	
% difference low bid to next low bid	0 - 3%	4 - 6%	> 6%	All
Avg. No. of C.O./job	21.6	12.2	14.5	16.9
Standard Deviation	10.6	3.2	2.5	8.4
No. Observations	8	6	4	18
Range	27	9	9	27

NUMBER OF CHANGE ORDERS VS DIFFERENCE LOW BID TO NEXT LOW BID

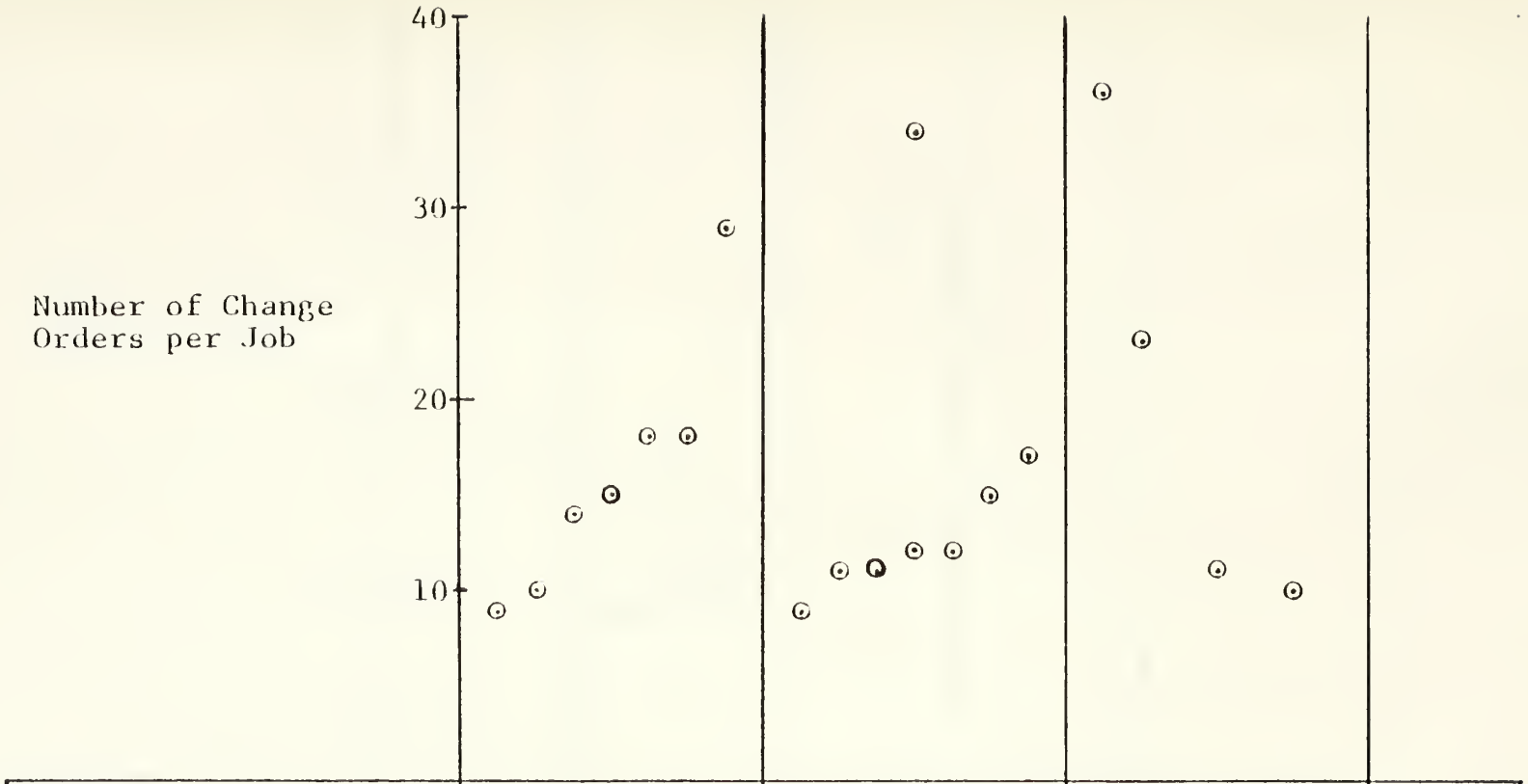
Figure C-5



Group	1	2	3	4	5
% Diff. between low bid & high bid	0 - 9	10 - 19	20 - 29	> 29	All
Avg. No. of C.O./Job	22	15.7	16.5	11.3	16.9
Standard Deviation	12.3	4.6	9.0	1.5	8.4
No. Observations	5	6	4	3	18
Range	26	14	20	3	23

NUMBER OF CHANGE ORDERS PER JOB VS % DIFFERENCE AWARD PRICE TO HIGHEST BID

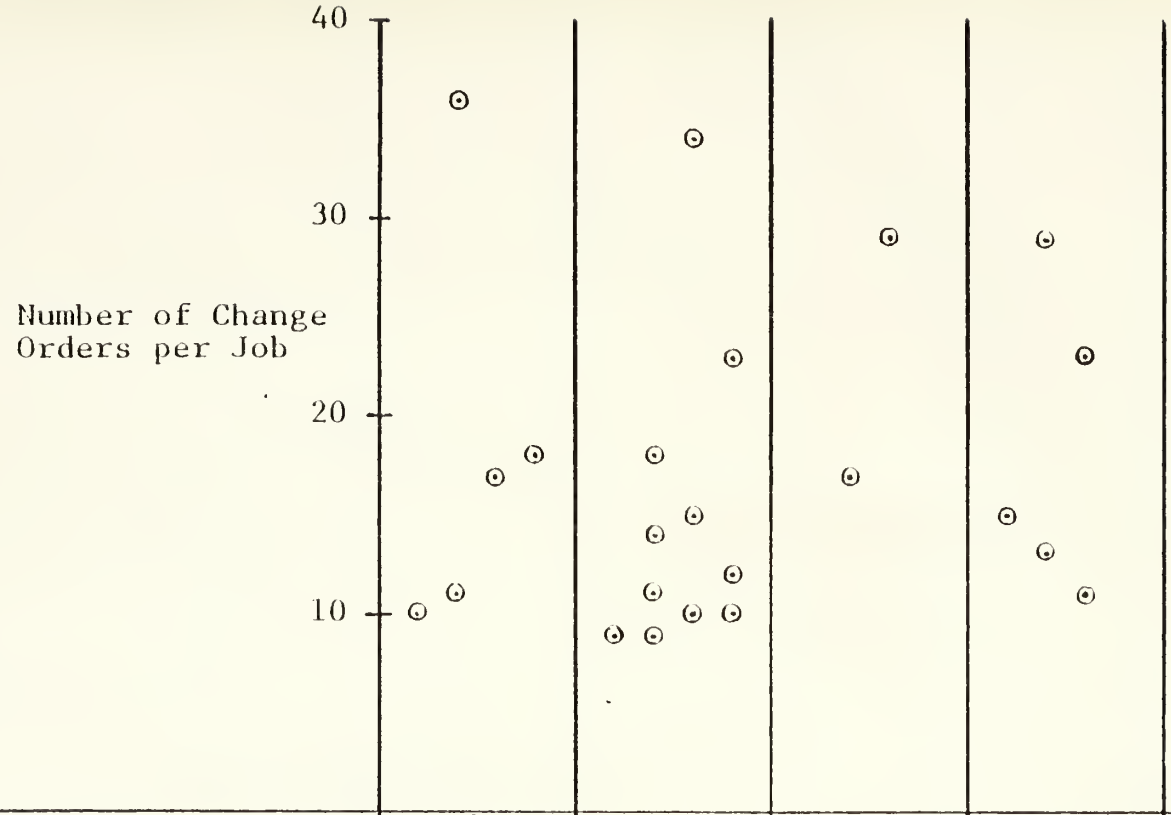
Figure C-6



Group	1	2	3	
Job Complexity	Not Complex(NC)	Complex(C)	Very Complex(VC)	All
Avg. No. of C.O./Job	16.1	15.1	20.5	16.6
Standard Deviation	6.7	8.0	11.7	8.2
No. Observations	7	8	4	19
Range	20	25	26	27

NUMBER OF CHANGE ORDERS PER JOB VS COMPLEXITY

Figure C-7



Group	1	2	3	4	
Type of Construction	I	C	H	S	All
Avg. No. C.O./Job	18.4	14.8	23.0	18.2	16.6
Standard Deviation	10.5	7.1	8.5	7.6	8.2
No. Observations	5	11	2	5	19
Range	26	25	12	18	27

NUMBER OF CHANGE ORDERS PER JOB VS TYPE OF CONSTRUCTION

Figure C-8

202497
Thesis
R81885 Rowland
c.1 The causes and effects of change orders on the construc-tion process.
26 AUG 88 31059 9

202497
Thesis
R81885 Rowland
c.1 The causes and effects of change orders on the construc-tion process.

thesR81885missing
The causes and effects of change orders
3 2768 001 97072 6
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